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The IRON AGE

Vol. 159, No. 9 February 27, 1947

Editorial

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Technical Articles

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Features

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News and Markets

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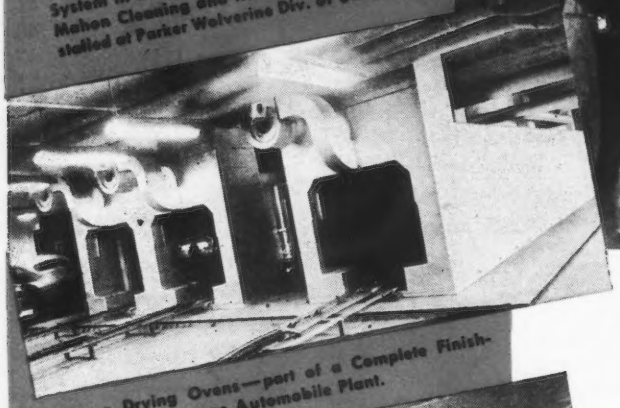
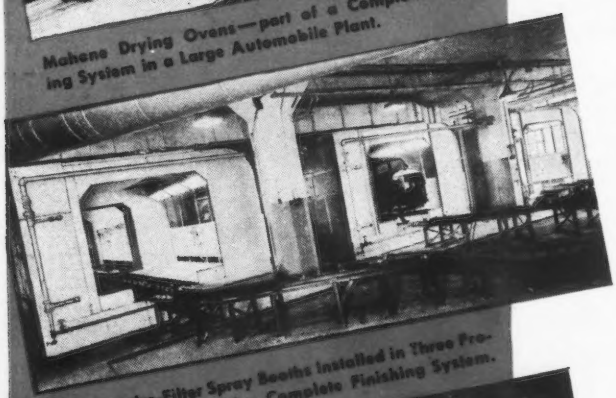
COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT

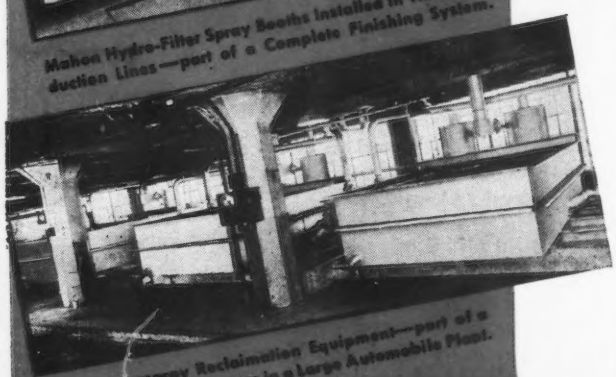
Above: Mahon Metal Cleaning and Rust Proofing Equipment—part of a Complete Finishing System in a Large Automobile Plant. At right: Mahon Cleaning and Rust Proofing System installed at Parker Wolverine Div. of Udilyte Corp.



Mahon Drying Ovens—part of a Complete Finishing System in a Large Automobile Plant.



Mahon Hydro-Filter Spray Booths installed in Three Production Lines—part of a Complete Finishing System.



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February 27, 1947

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Double, Double Toil and Trouble

THE British economy is in desperate straits. With material and emotional resources near exhaustion, with an industrial machine run down by decades of greed and neglect, with grievous shortages in manpower, food, housing and merchant ships, and with worldwide debt of frightening proportions, the outlook is one even to shake a people renowned for their dogged realism and courage. The next several years will see the coal crisis matched by other crises in food, in raw materials, in dollar exchange. Even with the grimmest intensity of purpose it's going to be a close squeak for the Tight Isle.

There is understandable tendency in this country to view the British venture into socialism with distaste. The coal crisis has been pointed up as a failure of socialism, indicative of an early return to Conservative rule. In England, however, even Conservative circles view the coal difficulty more as unwise gambling on a mild winter rather than a basic failure likely to lose the Labor Party the support of the Middle Class.

There has been surprisingly little Conservative opposition to nationalization measures so far taken. In some instances they have seemed to be almost welcomed as one possible means of recapturing some industrial efficiency. But further nationalization schemes, steel—for instance—may encounter serious opposition, more on practical grounds than for moral reasons. So far, the Labor Party has shown more zeal in working out nationalization plans than ability to administer industries once they are nationalized. A pause is indicated to consolidate what has already been done.

There also has been a reckless rush to further some of Labor's most cherished dreams—a 40-hr week, lifting the school-leaving age to 15 years, removal of women from men's jobs, one-shift working of industrial equipment, and, of course, more wages for less work, etc. Most of these objectives will have to be temporarily abandoned, and there is imperative need for wage and tax policies designed to increase incentives to work and enterprise. If Labor fails to take these painful and unpopular actions, then a desperate country may temporarily turn to Churchill, the Man of Crisis, or some coalition of Liberal and Labor Parties. Complete hopelessness may turn even the individualistic Britisher to a totalitarian police state, with its illusion of stability and progress.

By whatever twists and turns the British try to master their fate, the United States hardly can be just a passive spectator. Additional American credits will be requested and will be met by storms of protest here—particularly as the realization grows that the first loan will never be repaid. The protests may quickly die, however, if Britain turns to Russia for closer trade and barter ties. As for immediate help, there could be some easing of the current American demand for Britain to either return or purchase about 300 ships, now under charter for $2 million monthly. Hundreds of similar ships now lie unused in American harbors.

It's hardly likely that the United States can take a shoulder-shrugging Pilate-like attitude of indifference to industrial health in England. The sick economies of Japan, Germany, France and Italy will all tend to drag at continued American prosperity. A prostrate England could have long-range repercussions of serious proportions in this country.

T. W. Lippert

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IRON AGE — NEWSFRONT —

February 25, 1947

► U. S. Steel and the United Steelworkers negotiators are delving into economic matters this week-- which means that wage negotiations have started without awaiting final action on the portal-to-portal question. But the trend of the latter may determine the speed with which the wage question is settled.

► One of the largest producers of cast iron sanitaryware has just bought an interest in a company which manufactures drawn and stamped bathtubs and similar products. Stamped sanitaryware is about 20 years old but its progress has been slow until recently. Steelmakers and stamping plants therefore regard this action as a very significant trend.

► Supersonic testing of metals is expanding rapidly with some firms reporting that it is now a matter of routine inspection. The technique also shows great promise for rapid determination of metal grain size.

► Paint may soon become one of the tightest items in the automobile supply line, particularly for the new producers who were unable to establish large quotas. A critical shortage of glycerine used in the new metallic paints is one reason for the shortage.

► Unbalanced inventories of metal processors are still in the problem stage. Shipments of part orders are leaving fabricating plants which have heavy stocks of certain items but not enough of others to actually meet heavy production schedules. This condition is expected to be cleared up in 4 or 5 months as wartime sales and buying practices go by the board and closer customer-consumer relationships are established.

► Wholesale revision of steel extras over the past few months has added probably as much as $2 a ton to the consumer's average steel cost. But this doesn't mean that the steel company is getting $2 extra in every case for in past weeks consumers have been showing remarkable ingenuity in studying extra lists and revising specifications to avoid the higher charges.

► Most producers of merchant pig iron will probably increase prices by $3 a ton in the very near future.

► Foundry scrap, coke and pig iron, already tight, may become even scarcer if automotive foundry operations are carried out according to present plans. Ford and Pontiac will lead a parade of automotive manufacturers hoping to expand foundry operations as much as 100 pct in the next three months.

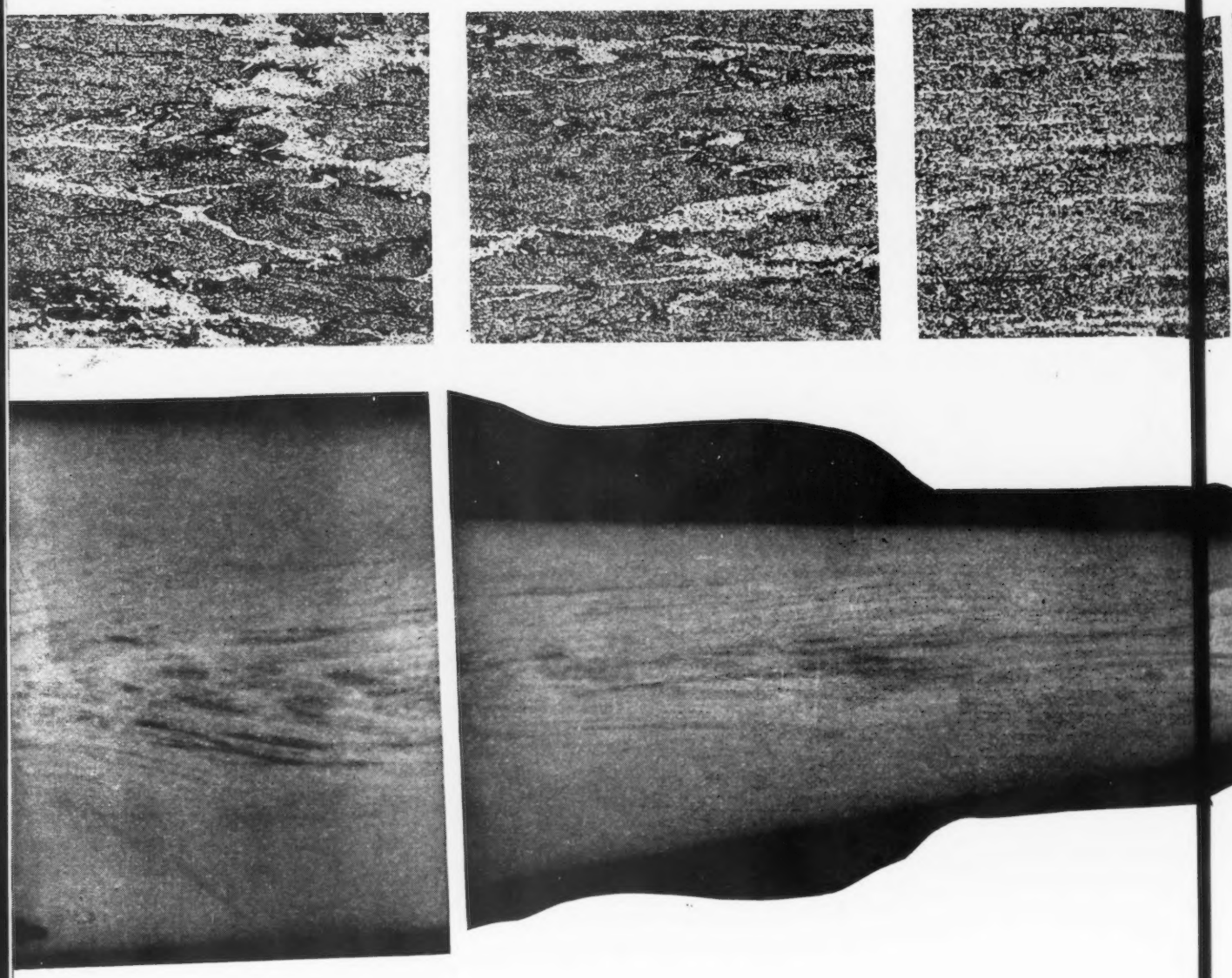
► Behind all the smoke of governmental pressure, congressional howling and rail industry efforts to get the steel industry to supply 165,000 tons of steel monthly for the freight car building program an amazing fact stands out. During October, the latest month for which distribution figures are available, steel shipments to independent builders and railroad shops for freight cars only--totaled 165,942 tons.

► Stainless steel is now widely used for screws to fasten plates of the same material to fractured bones. Vitallium screws, cast by the lost wax process are also employed in bone surgery. Formerly organic materials were used because metals then in use killed surrounding bone cells or corroded.

► The tightness of pig iron is renewing interest in the use of cupolas to provide hot metal from scrap for the openhearths. This is particularly true in the case of nonintegrated mills, several of which are planning such installations. One small eastern mill has acquired some surplus cupola equipment for this purpose.

► Blind riveting, which proved useful in war production, is finding many applications where it is difficult or impossible to buck a solid rivet. For example blind rivets which are upset by a pull rather than a blow, are being used to repair loose corrugated roofing sheets, attach hinges to steel refrigerators and replace damaged sheet steel bus and truck panels.

► Extensive investigations are being made in the heat recuperator field, especially for foreign countries where high fuel costs make economies in this field particularly attractive to management. Present investigations promise major technological advances in heat recuperators.

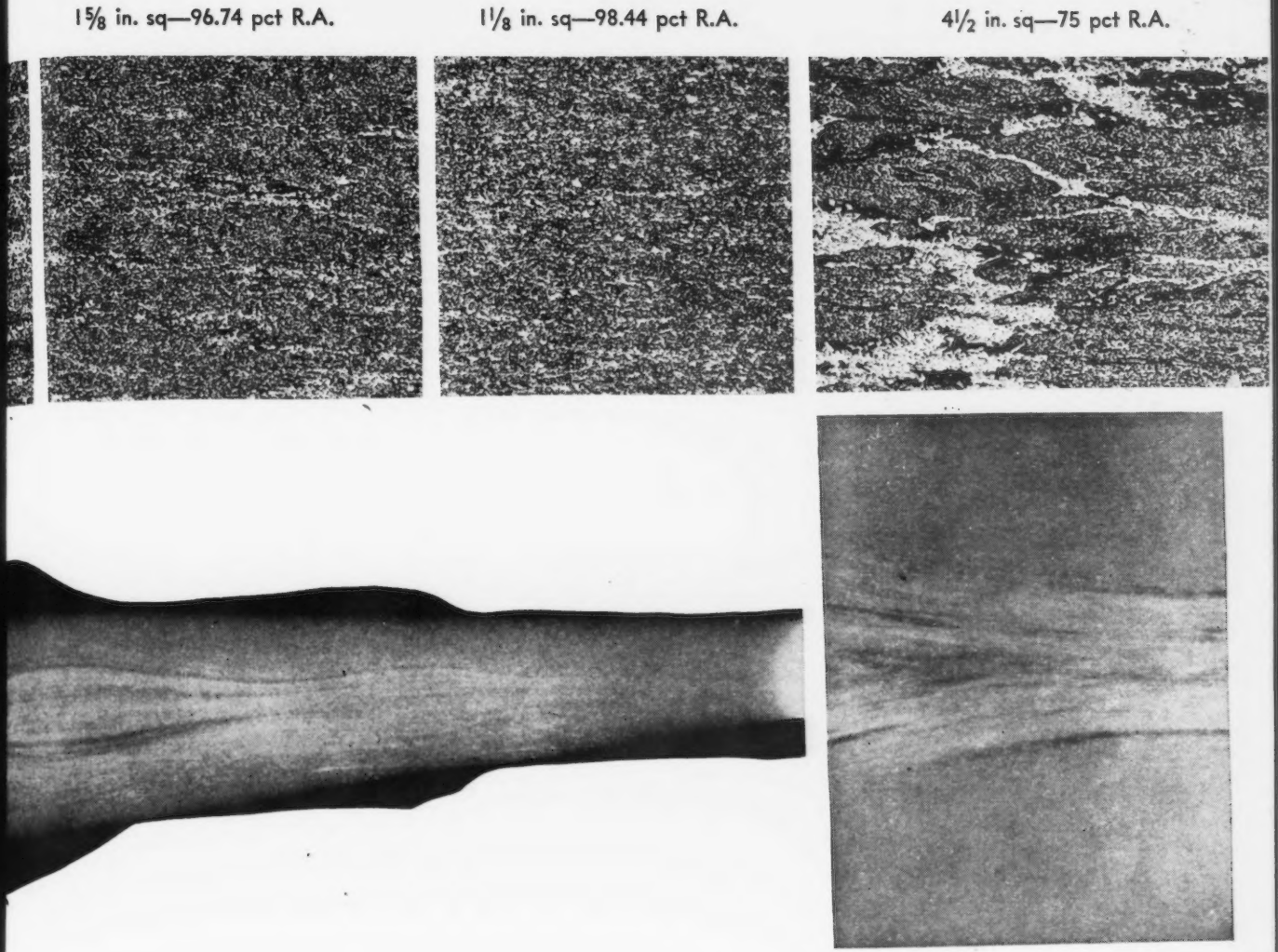


Effect of Forging on Segregation

THE effect of forge reduction on carbide distribution in high-speed steel is indicated in the accompanying illustration, wherein metallurgical structure is shown, correlated with X-ray examination, at various degrees of reduction. This experimental work, which was conducted by the tool steel division of Bethlehem Steel Co., indicates that a minimum of approximately 90 pct in reduction of ingot bar is necessary in order to obtain satisfactory carbide distribution.

The function of the forging operation in breaking up the coarse crystalline structure of the ingot, of redistributing the segregate, of compacting the central spongy area, and of welding small defects existing in the ingot, is apparent in the illustration. The carbide segregate in high-speed steel is quite refractory and larger particles do not completely dissolve, even when the steel is heated to the hardening range. The only way the carbide segregate can be broken up and redistributed is by hot working, such as forging or rolling —preferably forging, in view of its kneading action.

In the work done by Bethlehem Steel Co., a 9-in. ingot of high-speed steel, containing 0.74 C, 0.26 Mn, 0.017 P. 0.011 S, 0.16 Si, 4.19 Cr, 1.13 V and 18.27 W, was hot forged on a 12,000-lb steam hammer to a 4½-in. sq billet. A portion of the 4½-in. sq billet was



In High-Speed Steel

By E. S. KOPECKI
Metallurgical Editor

cut from a location representing the top end of the ingot. One end of the billet was sectioned longitudinally through the center and a slice 0.20 in. thick from this location was prepared for X ray examination. The remainder of the billet, except for the end opposite the location where the previous sample was cut, was forged down on one heat to successive steps of 3¾-in. sq, 2⅝-in. sq, 1⅝-in. sq and 1⅛ in. sq. A longitudinal center section 0.20-in. thick was prepared from the center of this forging.

The X ray examination was made at 75 to 80 kv, at a distance of 20 in. from the target plate, using an exposure of 225 milliampere sec. The X ray analysis is shown in the figure, correlated with metallurgical structure, at various degrees of reduction. The photomicrographs (150X) were taken in the center area of each step, and illustrate the most pronounced carbide banding found at each location.

The photographic sequence clearly emphasizes the gradual removal of carbide segregation and banding with greater reduction in ingot cross-sectional area. At 91.4 pct reduction, the segregation has been largely eliminated, although banding is still pronounced. The improvement in uniformity of carbide distribution was found to result in a considerable improvement in ductility of the steel.

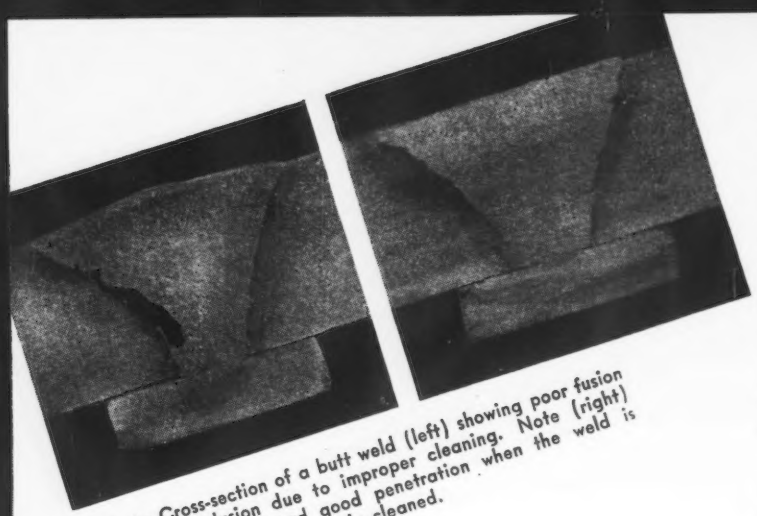


FIG. 1—Cross-section of a butt weld (left) showing poor fusion and slag inclusion due to improper cleaning. Note (right) the complete fusion and good penetration when the weld is properly cleaned.

How to Clean Welds

Joints which are not properly cleaned before, during and after welding cannot be expected to develop maximum strength or to pass visual or radiographic inspection. The effects of various kinds of foreign matter upon the quality of a welded joint, how the cleaning should be performed, and what tools should be employed are described herein.

o o o

By THOMAS L. ADAS
Chicago Mfg. & Distributing Co., Chicago

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CLEANLINESS is absolutely essential to the making of a good weld, and weld cleaning begins long before any actual welding is done, for the raw material that is used must be clean before clean welds can be made. Granting, however, that the base material is clean in the metallurgical sense, since this is a matter entirely outside the control of the welder, nevertheless many welders fail to realize the importance of properly cleaning the base metal prior to welding. If it is not clean, the welds will include defects which are the result of rust, oiliness and other foreign materials that might be on the base metal.

If rust is not removed from the base metal prior to welding, the heat of welding will liberate the oxygen from the iron oxide and as a result the weld will have blow holes, gas pockets and oxide inclusions. Most materials have oily surfaces as a result of the oil and grease accumulating during the rolling operations or subsequent machine operations prior to welding. This oil, when heated, vaporizes and also forms gas pockets and blow holes in the weld metal.

If the base metal is dirty, some of the dirt particles, when burned, form an ash, while others may combine with the weld metal to form an undesirable slag. In either event, their inclusion in the weld metal results in an unsatisfactory weld.

From these difficulties it may seem that preweld cleaning is important. In most instances a vigorous brushing of the base metal will result in a satisfactory cleaning job. Brushing actions will remove rust and dirt. If the rust is extremely scaly, it may be necessary to peen the weld with a chisel-shaped hammer. Oiliness, in some instances, may be removed by vigorous brushing, but in other instances chemical cleaning is necessary.

Equally as important as preweld cleaning are the cleaning operations carried on during welding and after the welding has been completed. As successive beads of weld metal are deposited in arcwelding, it is extremely important that the slag be properly removed. Unless these precautions are taken, there is a likelihood of slag inclusions which will materially weaken the weld. Welding over slag also may result in blow holes, gas pockets and other undesirable characteristics in the finished weld, as shown in fig. 1.

After welding has been completed, the weld should be cleaned so that it will have a neat appearance, if for no other reason. Proper cleaning of the weld also affords the welder an opportunity to inspect the surface and take care of any deficiencies that might appear in the weld deposit. If the finish weldment is to receive subsequent finishing, it is very essential that the weld be properly cleaned. Otherwise, rapid deterioration of the finish may result.

There are a variety of ways in which welds may be cleaned. Probably the most satisfactory is by sand or shot blasting. In this cleaning method rapidly moving particles of sand produce a combination peening and brushing effect. The disadvantage of using sand blasting is the cost of the equipment required. Unless the plant is large, having a huge volume of business, it is not likely that sand blasting can be advantageously used.

The highly efficient cleaning qualities of sand blasting may be obtained by manual operations through the use of a manual or mechanical brush

and hammer. These tools are extremely advantageous because of their relative low cost and ease of replacement. While hand tools may not do as quick a job as a pneumatic chipping hammer and a power driven brush, they are considerably less costly. Likewise, they do not require additional sources of power such as an air compressor to operate them.

By the use of a properly shaped chipping hammer, fig. 2, that is, one equipped with either a drift and chisel end or chisels on each end set at right angles to each other, the welder will be able to properly peen a weld. This peening action accomplishes two purposes: (1) That of knocking loose slag or scale that might be present and (2) compacting of the welding metal slightly so that it will be of higher density and consequently sounder and stronger.

The peening action, followed by a vigorous brushing, will remove all of the loose particles from the weld, thereby eliminating the possibility of their inclusion in subsequent weld beads.

Grinding is sometimes used for cleaning of welds. It has its advantages in that part of the surface of the base metal or weld metal is ground away. In this manner, oily, dirty and rust covered surfaces are removed. Grinding presents a disadvantage, however, in that there is again high initial cost for equipment with added cost for operation. Likewise, the grinder is removing the most costly of commercial metals—weld metal.

Where oily surfaces are involved or the weld metal is deposited with a flux which is corrosive in nature and must be thoroughly removed, chemical cleaning is frequently necessary. There are many patented cleaners as well as commercial solvents available for this purpose. The type of cleaner used depends in a large measure upon the type of cleaning job to be done. It is best when using cleaners of this type to follow the recommendations of the manufacturer. He is in the best position to recommend a satisfactory type cleaner for a particular welding operation.

The welder must never lose sight of the fact that a clean sound weld cannot be made if the welding begins on dirty metal. Of equal importance, however, is the cleaning operation during welding. This is particularly important when welding thick plates because this involves deep grooves and many passes or layers of weld metal.

After the initial bead has been laid, care should be exercised to see that it is thoroughly clean. Inasmuch as the welder is working in a deep groove, he will probably find it most convenient to use a hammer with a chisel head. In this instance the point of the chisel should be parallel to the handle. This makes it possible for him to look into the groove and place the chisel part soundly along the edges where the weld joins the base metal. It is in

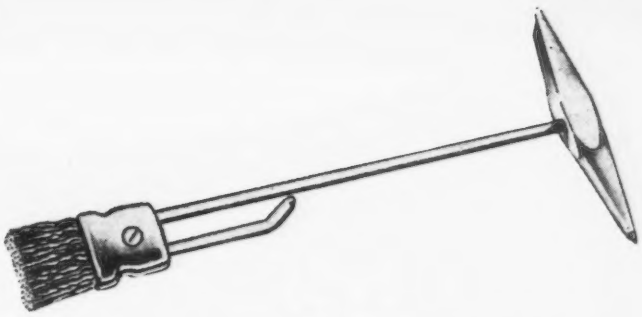


FIG. 2—Chipping hammers of this type provide chisel and drift ends for reaching all parts of a weld and a stiff brush for removal of slag and loose particles.

these narrow pockets that slag is often trapped. The drift end is handy where it is necessary to get at globules of slag which are stuck in the ripples of the bead. If this slag is not removed, it will subsequently appear in an Xray, and as a result it will be necessary to do a lot of chipping and rewelding.

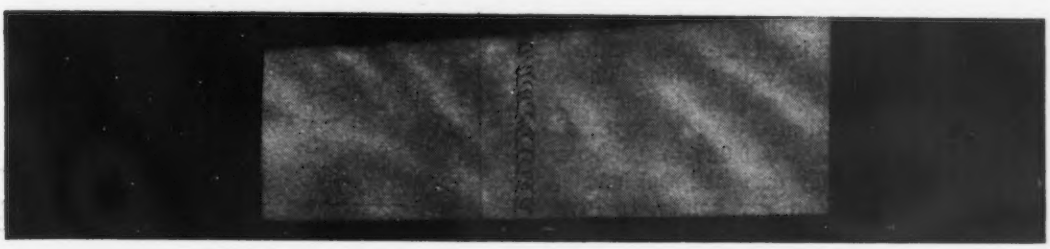
After having thoroughly peened the slag, so as to loosen it from the weld bead, the next move is the brushing operation. This may best be accomplished by firmly gripping the handle of a combination brush-hammer in one hand and the head of the hammer in the other, and digging the brush into the weld metal so as to knock loose any particles of slag that might be left after the peening operation. By using the brush in this manner, a vigorous scrubbing of the weld bead may be accomplished. Thorough action along these lines will preclude any possibilities of dirt or slag being entrapped by subsequent beads.

As the weld progresses and the groove is more nearly filled, it may be possible to use a hammer having a chisel point at right angles to the handle. Such a hammer will effectively chip the slag away and may be used with sufficient vigor to compact the weld metal. Here again the bead must be thoroughly brushed so as to remove the particles not loosened by peening.

The above operations are recommended primarily for ferrous materials such as steel and cast iron. When dealing with nonferrous materials, similar cleaning tactics are employed but usually with less vigor.

On nonferrous materials such as bronze, aluminum, magnesium and other metals which are comparatively soft, care must be exercised, particularly during the peening operations, not to damage the base metal by unsightly marks or deformations. Other than the fact that the operation on the weld is done in a gentle manner, the same basic principles as outlined for ferrous materials are followed. It

FIG. 3—Properly cleaned before, during and after welding, a joint should present a neat, clean appearance as shown here.



will be found that some of the fluxes used in nonferrous welding produce an extremely hard slag. In view of this, care must be exercised to properly remove the slag and at the same time not damage the piece being welded.

Welders rarely think of cleaning gas welds. It is just as important, however, that preweld cleaning be employed in gas welding applications as it is in arcwelding. The base metal in gas welding may be rusty, oily or dirty just as the base metal used in arcwelding. The rust and foreign material should be removed by vigorous brushing. As a rule, the heat of the oxyacetylene flame is sufficient to burn away any oil or grease that might be on the material.

After having burned away these materials, however, it is well to give the weld groove a vigorous brushing prior to beginning welding. It must be remembered that oils and greases are primarily carbons and though they may be burnt away, a carbon residue is left on the surface which may produce defective welds. This is especially true in gas welding operations where carbon residue and oxygen may combine to form carbon dioxide and result in gas pockets and blow holes.

In the gas welding of nonferrous materials, a flux is generally used. On the bronzes, this flux forms a glass-like slag and, if care is not exercised in its removal, it may readily be included in subsequent weld beads. In the welding of magnesium and aluminum, a corrosive type of flux is used. If it is not thoroughly removed during and after welding, corrosion will set in, and the weld and base metal will deteriorate very rapidly. The need for proper cleaning of aluminum and magnesium welds cannot be emphasized too greatly.

Visual inspection is the best way to tell whether a weld has been satisfactorily cleaned. Such inspection, of course, cannot be casual, it must be thorough. The nature of all weld beads is such that they contain many ripples. Each of these ripples make an ideal pocket to entrap slag. Visual inspection must determine that the ripples, as well as the remaining weld surface, are thoroughly cleaned.

The junction line between the weld metal and the base metal is another point where slag may be entrapped. If the weldment is to be painted, it is well to test the cleanliness of the weld bead with chemicals to determine whether all of the alkaline compounds deposited by the welding electrode coating or the welding flux have been thoroughly brushed or washed away. These alkaline compounds result from the contact of the slag with the weld metal and in some instances remain in sufficient quantity to cause paint deterioration.

Thorough brushing is also necessary to remove arc smoke which may be deposited during the welding operation. In some instances, brushing is not enough and chemical cleaning agents must be used to attain the desired cleanliness.

There are many things to be gained by having clean welds. As was pointed out previously, weld metal is the most costly of commercial metals. If it contains blow holes, slag inclusions or other imperfections, it may not be suitable for the service intended. If this is the case, it is necessary to chip out the metal and reweld—an operation which could have been avoided by properly cleaning during welding.

A clean weld means a cheaper weld as well as a sound weld. When welding is completed and the weld is finally cleaned, it will be found that a clean weld presents a much more finished appearing product, as shown in fig. 3. If the weldment is to be subsequently painted, enameled or otherwise finished, it is necessary to have a clean weld and the area about the weld clean before a satisfactory finished surface may be attained.

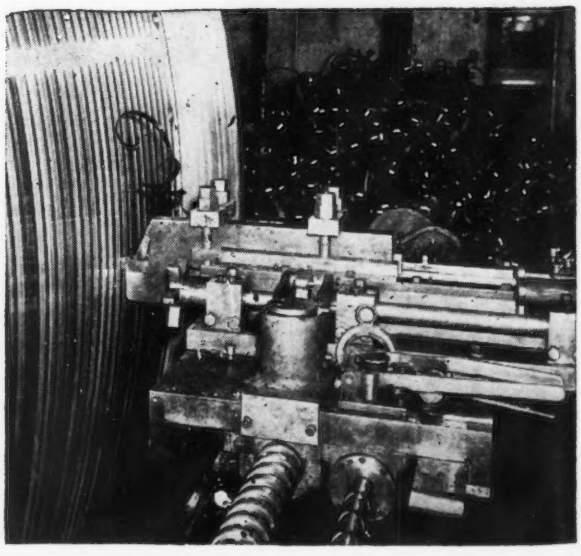
Mass Production — Of Chips

REMOVING 12 tons of chips from a single workpiece in a single setup on a lathe represents an extremely unusual job being regularly performed in the Bartlett Hayward plant of Koppers Co., Inc., at Baltimore. The parts are mine hoist drums, 20 ft in diam, with a flange 21½ ft in diam. The width between the flanges is 7 ft 10½ in, and the job is to remove the metal between the flanges and turn the flanges down to size.

A specially designed pit lathe is used for this type of work and machining consists of first roughing the flange sides and face and drum OD, and then plunge cutting the grooves in the drum in which the 2½-in. wide mine hoist cable is to lie. Grooves are finish formed.

Since cutting time is the major factor in total production time of such a job, Carboloy tools are used for all operations. The roughing tools are standard 1¼-in. square shank tools tipped with carbide. These cut at a surface speed of 240 fpm 3 to 4 times the speed possible with high speed steel tools. Depth of cut is ¾ in. on roughing. Feed is 0.020 to 0.030 in. Tools are mounted in a specially designed tool holder, consisting of a heavy extension bar holder, to give the tool maximum support.

GROOVING operation on a mine hoist drum. Grooves are plunge cut to depth with a ¾-in. wide Carboloy tool and finished with a form tool ground to a 1⅜-in. radius. Complete turning and grooving operation requires the removal of 12 tons of chips.



How to Use

Carbide Cutters for Milling

• • • Straight Carbon and Cast Steel

The milling of straight carbon steels in the rolled or forged condition and of cast steel is considered herein. The discussion takes into account the advantages of employing a heavy chip load and a high K-factor and gives the underlying reasons for the use of a relatively small number of blades in the cutters. A method of setting the blades in place while the cutter is held in the machine is given, and the advantages of this are explained.

By H. A. FROMMELT
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UNTIL very recently steel was milled successfully at surface foot rates up to 100 fpm. This century mark represented the high in a gradual evolution that started at a ½ dozen fpm during the Civil War using carbon tool steel cutters. With the advent of high speed steel, introduced into this country as late as 1890, but not made available in the form of milling cutters until about 1912, the rate was increased to approximately 12 to 15. Then came refinements in high speed steel, which resulted in an increase in the rate up to 25. The cast materials made available during the first World War made it possible to increase this rate to 50. The super high speed steel that appeared a few years after World War I raised the rate for the milling of steel to 50 and higher. In order to include all variations of this material the surface foot rate may be set at 100. Perhaps the vast majority of steels were milled, until 1940, at a rate not greater than 50 to 60 fpm. Occasionally, with softer materials and lighter cuts this was increased to 100.

Then the ceiling on surface foot rates was suddenly lifted to an average of 500. Thus in one jump the rate was increased five times. This astronomical increase is due to the availability of tungsten titanium carbide, representing a big step in the development of tungsten carbide originally introduced in 1928.

The surface foot rates for the milling of steel actually vary from 300 to 1000, with the most frequently used range lying between 400 and 600. Therefore it is perhaps correct to speak of an average surface foot rate of 500. Table III gives surface foot rates, and rpm for cutters of various sizes applicable to the milling of steel, based solely upon the hardness of the steel. Obviously, here, the surface foot rate increases as the hardness decreases. For the extremely soft steels the rate is in the neighborhood of 600 or more.

The average surface foot rate for straight carbon steel can be put down as approximately 500. This applies, however, only to rolled and forged straight carbon steels. Since this present article will include cast steel, it is necessary to modify the above statements concerning a surface foot rate range that can be applied to these straight carbon steels.

Cast steel which normally comes from the open-hearth steel foundries with 28 points of carbon, some-

TABLE III

Recommended Spindle and Surface Speeds for Various Size Cutters

Brinell Hardness	Surface ft per min	CUTTER DIAMETER											
		½-in.	¾-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	5-in.	6-in.	8-in.	10-in.	12-in.
		RPM											
120–140	700–660	5384–5077	3500–3300	2692–2538	1800–1700	1346–1270	900–846	673–634	540–507	450–420	330–314	270–254	224–211
140–160	660–620	5077–4769	3300–3100	2538–2385	1700–1600	1270–1200	846–800	634–600	507–470	420–400	314–298	254–240	211–200
160–180	620–590	4769–4538	3100–2950	2385–2270	1600–1520	1200–1134	800–757	600–570	470–454	400–380	296–285	240–230	200–190
180–220	590–535	4538–4115	2950–2675	2270–2060	1520–1370	1134–1030	757–686	570–515	454–411	380–340	285–260	230–205	190–170
220–300	535–447	4115–3438	2675–2235	2060–1720	1370–1140	1030–860	686–572	515–430	411–344	340–285	260–215	205–170	170–140
300–420	447–338	3438–2600	2235–2100	1720–1300	1140–865	860–650	572–446	430–325	344–260	285–215	215–160	170–130	140–107

Courtesy Kennametal, Inc.

times, because of specifications, appears with 30 or more points of carbon. The machinability, however, varies little, if any, with this increase in the carbon content. Cast steels, such as are normally specified for steel castings, require the application of an entirely different carbide milling technique. This starts with the change in the surface foot rate. Because of the increased abrasion effect of the steel casting—a sandy surface is usually associated with these steel castings —it becomes necessary to reduce the surface foot rate. Conservatively, the rpm on the spindle should be set up so that the surface foot rate of the cutter lies somewhere between 250 and 350 fpm.

The second change in the technique involves the use of a different grade of carbide from that used, for example, on low carbon steels. A steel cutting grade of carbide having considerably increased resistance to abrasion such as is presented by a steel casting is thus necessary.

For the remaining specifications in the operating technique there are relatively few changes. The fundamental precept regarding a relatively heavy chip lead, providing the workpiece is suitable, is just as valid for the milling of cast steel components.

By way of summary of the foregoing remarks (including those in other articles in this series) it may be well to tabulate the outstanding characteristics considered essential in the technique for the milling of these straight carbon steels, including cast steel.

Milling Straight Carbon Steel

As noted in the introduction to this article a high surface foot rate, at least relatively speaking, is essential for success in the milling of these steels. Whereas only a short while ago 100 fpm was considered the ceiling, steels are now being milled in this category at an average rate of 500 fpm. This is both necessary and possible; necessary since a lower surface foot rate proves detrimental in the wear life of the carbide, and possible because these sintered cutting materials, plus the new technique of milling, make possible these higher surface foot rates while at the same time result in a greatly increased tool life.

Common to all milling operations with carbide, a heavy chip load is considered advisable. This statement must be modified where the power in the machine tool is limited and where the workpiece does not permit the taking of cuts by means of which large quantities of metal are removed. However, wherever the availability of power and the nature of the workpiece (heavy cross-sections) permit, a heavy chip load is advisable from a cutter life standpoint. The thicker the chip that is being removed the further the cutting forces are directed away from the cutting edge. Hence, a heavy chip load, within limitations, presents a safety factor to the critical portion of the carbide blade, namely the cutting edge.

Table IV shows the relationship between feed rates and horsepower. Carbide milling starts with specific information concerning the amount of power available in the machine to be used. Where this is known, including the depth and width of the cut, the feed rate can be determined by reference to the table.

It is significant that in carbide milling, operations must be begun with a definite knowledge of the power available. Heretofore, with other cutting materials,

TABLE IV

Maximum Feed Rates for Milling Steel

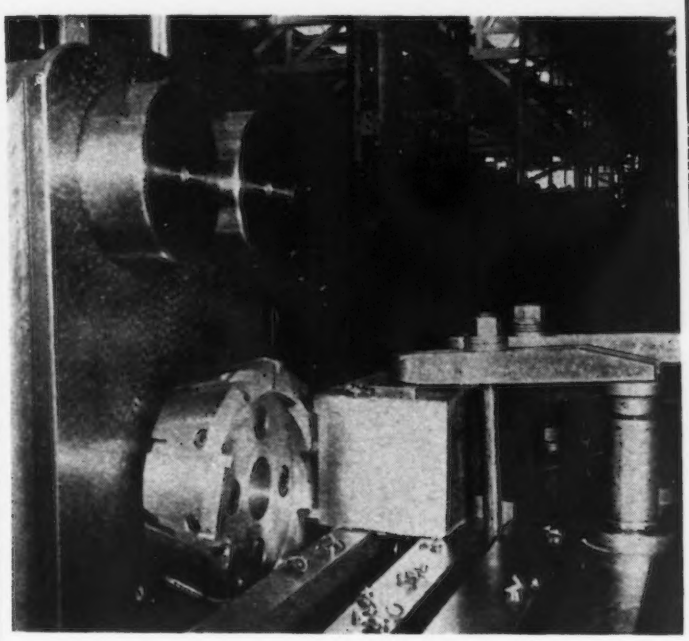
Width of Cut In.	Recommended Cutter Diam. In.	HP.	DEPTH OF CUT AND FEED RATE						
			.050	.100	.150	.200	.250	.300	.350
2	4	3	22½	11	7½	5½	4½	3½	3
		5	38	19	12	9	7½	6	5½
		7½	56	28	19	14	11½	9½	8
		10	60*	38	25	19	15	12½	10½
		15	60*	55	37	28	23	19	16
		20	60*	60*	50	38	30	25	22
		50	60*	60*	60*	60*	60*	60*	53
4	6	3	11	5½	3½	2¾	2¼	1¾	1½
		5	18	9	6	5	4	3	2½
		7½	28	14	9½	7½	5½	4½	4
		10	38	19	12½	9½	7½	6½	5½
		15	54	27	18	14	11½	9½	8½
		20	60*	38	25	19	15	12½	10½
		50	60*	60*	60*	46	37	30	26
5	8	3	9	4½	3	2¼	1¾	1½	1¼
		5	15	7½	5	4	3	2½	2
		7½	23	11½	7½	5½	4½	3½	3
		10	30	15	10	7½	6	5	4½
		15	44	22	14	11½	9½	7½	6½
		20	60	30	20	15	12	10	8½
		50	60*	60*	50	37	30	25	21
6	10	3	7	3½	2½	1¾	1½	1¼	1
		5	12	6	4	3	2½	2	1½
		7½	18	9	6	4½	3½	3	2½
		10	25	12½	8½	6½	5	4½	3½
		15	36	18	12	9½	8	6½	5½
		20	50	25	17	12	10	8½	7
		50	60*	60*	41	30	25	21	17
7	12	3	6	3	2	1½	1¼	1	¾
		5	10½	5½	3½	2¾	2¼	1¾	1¼
		7½	16	8	5½	4	3½	2¾	2¼
		10	22	10½	7	5	4	3½	3
		15	32	16	10½	8½	6½	5½	4½
		20	43	21	14½	10½	9	7	6
		50	60*	53	35	26	21	18	15

* Highest available feed rate on standard machines.

Courtesy Kennametal Inc.

the power available in a milling machine was seldom approached, not to say exceeded. The size of the motor was never questioned. The cutting materials being the limiting factor, the feeds and speeds that were necessarily selected represented a loading of the machine well below that represented by the horsepower in the driving or spindle motor. In fact, a brief survey in any plant will disclose that machine tools with cutting materials other than the sintered carbides seldom require more than 25 to 50 pct of the power available.

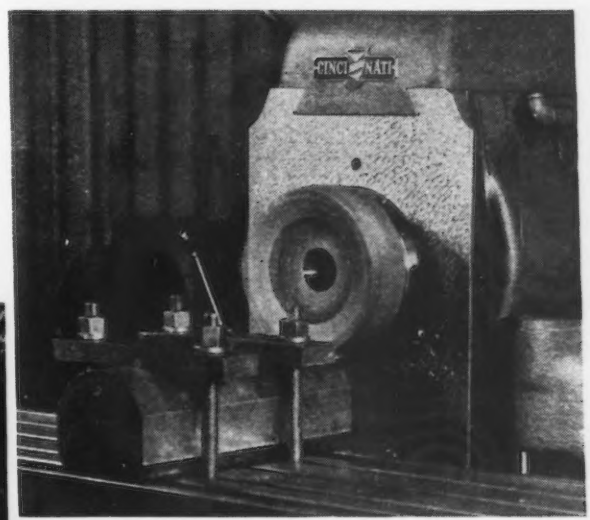
Now that the newer cutting materials are being applied, it becomes necessary, as a first step, to determine the horsepower available. It is possible to remove 75 cu in. of steel per min when 50 hp is available. As much as 150 cu in. of cast iron have been moved per min where a suitable carbide milling cutter could be mounted on a 50 hp spindle. This indicates that the upper limit of the metal removal rate has not been reached. So far as is known, these sintered carbide cutting materials will perform satisfactorily



when removing 200 cu in. of steel and 300 cu in. of cast iron per min. This will be possible when machine tool builders design a 100 hp spindle.

This brings the discussion to a brief consideration of the so-called K-factor which is closely allied to chip load. The K-factor, or the power required to remove a cu in. of metal per min, depends primarily upon the physical, chemical and metallurgical characteristics of the material being milled. The older techniques, both for the milling of steel and cast iron, call for a hp per cu in. per min rate two and three times higher than those now possible with carbide. It should be noted that steel, untreated, and in the brackets considered in this discussion, can be milled with ½ hp per cu in. per min. Quite naturally the harder and therefore higher tensile strength steels require more power. The same materials milled with the older cutting materials would require, instead of ½ hp per cu in. per min, at least 1½ to 2. Standard handbook references for these classifications go as high as 2 hp per cu in. per min.

It is well worth noting that this characteristic of carbide milling presents a powerful management production tool. The same equipment, otherwise suitable for good milling, can now be made to produce two to three times the volume in chips as when equipped with high speed steel cutters. Thus, without any additional capital investment, machine tool equipment properly set up with carbide cutters, and operated according to the demands for good milling practice, suddenly increases capacity by 100 or more pct.



ABOVE

FIG. 19—The second step in assembling cutter blades is to take a cut in the workpiece, using the single blade as a fly cutter.

° ° °

LEFT

FIG. 18—The cleanliness, easy visibility, and freedom from general messiness caused by the elimination of cutting fluids is readily apparent here.

Dry Milling

As in all carbide milling operations, the application of carbide to straight carbon steels calls for dry milling. While this does not involve a large reduction in the expenses incidental to milling, the byproduct results are worth considering. The cleanliness of the carbide operations is immediately noticeable and appreciated by the operators. Housekeeping becomes a simpler task, and in addition, the expense involved in providing suitable coolants is eliminated. Beyond this the damage frequently done by coolants coming in contact with lubricating oils (in the knee and column of knee-type machines) is prevented.

Since much if not all of the heat of work in carbide milling appears in the chip rather than the workpiece, this dry milling is possible. Fig. 18 shows the newer technique. The difference can be appreciated immediately.

Use of a flywheel built in as an integral part of a milling machine makes possible a smooth flow of power to the spindle and cutter. This is advisable, if not

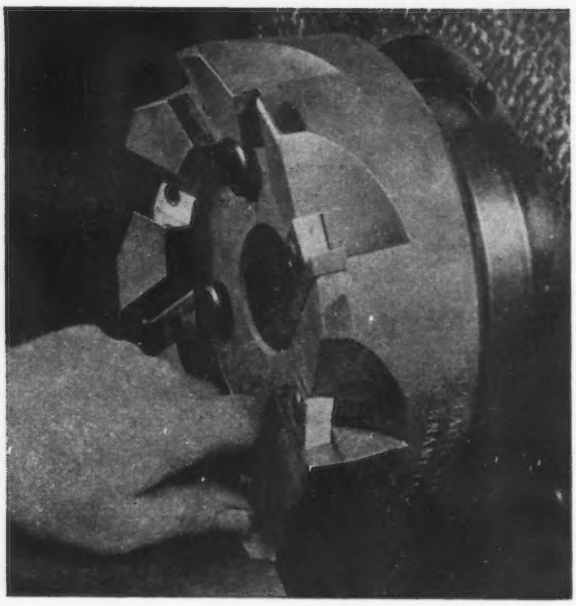


FIG. 20—The remaining blades are inserted and set to the shoulder of the fly cut after the workpiece has been retracted slightly to avoid contact with the face.

necessary, for good carbide life, since carbide cutters are essentially coarse pitched. That is, relatively few teeth are designed into these cutter bodies. The reasons for this will be discussed in a separate article on milling cutter design. Here, however, it may be noted that using the same number of teeth in a carbide milling cutter as commonly made available in a high speed steel milling cutter would necessitate machines with extremely large horsepower and high table feed rates. If chip loads from 0.005 to 0.010 in. (considered the minimum) were used with the large number of blades and at the surface foot rate called for by carbide, the table rates or the ipm would be excessive.

Thus, for example, if an 8-in. diam cutter had 20 blades, as customary with high speed steel, instead of the traditional 8 or 10 as designed for carbide, then using a chip load of 0.010 in. with 20 blades would result in a feed per revolution of 0.200 in. In the milling of straight carbon steels a surface foot rate of approximately 500 is called for, which with an 8-in. cutter results in a spindle speed of approximately 250. Thus the table feed rate for this operation would be 50 ipm. If the workpiece width to be milled were 5 in. and the depth of cut 0.250 in., the rate of metal removal with this table feed would be approximately 62½ ipm. This, for safe operation, would call for a machine with a 50 hp motor.

While such equipment is now available, the vast majority of the standard equipment has less than half this amount of power available for the spindle in the largest sizes. Standard milling machines from No. 2 to No. 5 size range in power from 3 hp to 20 hp. Hence it becomes necessary to restrict the number of blades if only because of the restricted power available in 99 pct of all milling machines now being used.

There are other and even more cogent reasons for using few blades, relatively speaking, but these have to do with proper chip ejection and removal and are more properly considered in a subsequent article devoted to design of milling cutters.

The remainder of this exposition on the milling of straight carbon steels will deal with the fundamentals of this technique as applied to actual shop operations. For the first of these, consideration will be given to a typical cast steel component of standard composition. Its characteristics therefore are sandy, and pitted surfaces present considerable abrasive effect to the carbide. Hence in setting up this operation for good results, particularly as regards cutter life, it was necessary to take into consideration the following factors:

(1) Restrict the surface foot rate to 250 fpm. This is approximately 25 pct of the rate that would be called for in milling a steel with the same carbon composition.

(2) Apply a grade of carbide whose resistance to abrasion is one of its outstanding characteristics.

Both these factors have been taken into account in setting up this job. This operation involves the removal of metal in a badly interrupted cut. The workpiece face areas are relatively small and narrow, and hence it is impossible to keep more than one blade in the workpiece at any given instant. Thus gear train back lash will be taken up and released as each blade enters and exits respectively.

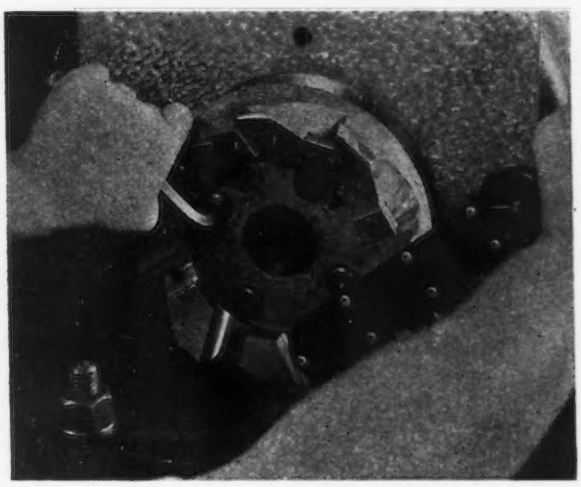


FIG. 21—To complete the operation of setting up, the setscrews are tightened with a torque wrench to a 300 in. lb torque.

While this effect on the machine could have been considerably eliminated by the application of a flywheel, it was considered inadvisable since the number of pieces in this particular run did not justify it. However, standard equipment such as the Cincinnati No. 3 used in this case should be given the advantages of a flywheel assembly on the spindle as close to the cutter or workpiece as possible.

A surface foot rate of 250 fpm was selected for the operation. With an 8-in. cutter as used here this results in a spindle speed selection of 120 rpm. While the horsepower available in this machine (a standard No. 3 milling machine, knee type) is 10 hp, it was considered advisable to restrict the power called for by this carbide milling operation to no more than one half of that available in the motor. Thus a sufficient factor of safety is applied to the gear train, the clutch and other vital parts in the equipment.

Even with these self-imposed restrictions carbide increased the production three times on this operation. Whereas five pieces were produced in an 8-hr

period with high speed steel previously, 15 are now produced with carbide.

More important still, however, is the following information concerning cutter life: Three high speed steel cutters broke down while attempting the milling of five of these components. In addition, the finish was such that it proved unacceptable in inspection. With carbide cutters the finish is entirely satisfactory and all of the pieces in this particular lot were milled without change of blades.

Cutter Setting

It is interesting to note also that the solid carbide blades for this operation were installed with the cutter body on the spindle. This was done approximately as follows:

(1) A set of freshly ground blades and wedges was made available to the operator. One blade and one wedge was installed properly in a slot with an overhang of approximately 1/16 in. Fig. 19 shows the taking of a fly cut with this one blade. This fly cut represents a gage made by this machine. Whatever runout exists in the spindle is reproduced by the machine itself in the taking of this fly cut.

(2) The remaining blades are now set to the shoulder, not the face, of this fly cut as shown in fig. 20. This method of setting makes it possible to restrict the runout on the OD or the blades in the cutter body to 0.0005 in. Prior to the setting of the blades to the shoulder of the fly cut, the workpiece is retracted from the cutter approximately 0.010 in. This insures all blades being seated on the shoulder of the fly cut and not wedging between the face of the fly cut and the flat bottom in the cutter. Tolerances in blade depth and slot depth restrict runout on the face to a few thousandths. Unless the caution just referred to is observed, high blades may not be set to the shoulder of the fly cut, and hence will not be restricted in OD runout to a minimum. This latter is essential since all blades must take an approximately equal chip load for smooth operation of the cutter.

Runout on the face is entirely permissible and even capitalized on in this technique. All blades are ground with a zero dish angle of sufficient length to cover the feed marks in one revolution. Thus the high blade, whichever it may be, acts as a fly cutter in finishing the workpiece surface. Hence runout on the face, of an average of several thousandths, is not only permissible but desirable.

Fig. 21 shows the operation of properly wedging these solid carbide blades into position by a 300 in. lb pull on the Allen screw which wedges the blade firmly into final position.

Thus, to return to the milling of the steel components, the inaccuracies in this machine are compensated for by this method of blade setting. While this feature of the technique may not be permissible or even advisable in high production runs where down time on the machine is an important factor, it is not only advisable but highly desirable that the blades be set in the manner described when short run jobs are being milled as in this operation.

The weldment shown in fig. 22 presents an extremely interesting operation on a so-called straight carbon steel component. These weldments, weighing approximately 26 tons each, had been previously planed on the surfaces visible in this illustration. For the operation in carbide milling they are mounted on the bed of a large No. 8 Giddings and Lewis machine having a 30 hp motor.

Aside from the ordinary problems involved in milling steel, several additional interesting though troublesome factors presented themselves. Obviously it was necessary to mill these surfaces with a satisfactory matching of the 5-in. wide lane removed with each pass of an 8-in. cutter. Carbide milling cutters will assist in producing matched lanes, although this result is largely a product of a good machine tool. In addition, milling a 5-in. wide surface, to a shoulder, in relatively soft or straight carbon steel components, presents the additional problem of proper chip ejection and elimination. In operations similar to this, steel chips tend not to clear themselves freely from the cutter, thus interfering in the chip clearance space, resulting in damage to the milled surface and increasing the horsepower required.

These and all the problems involved in this milling operation were successfully solved. The spindle speed selected was 240 rpm. The surface foot rate under these conditions was 500 fpm. The chip load represented by a table feed of 20 ipm was 0.010 in. Thus the horsepower called for by this milling operation was approximately 20 hp.

Under these conditions the results were extremely

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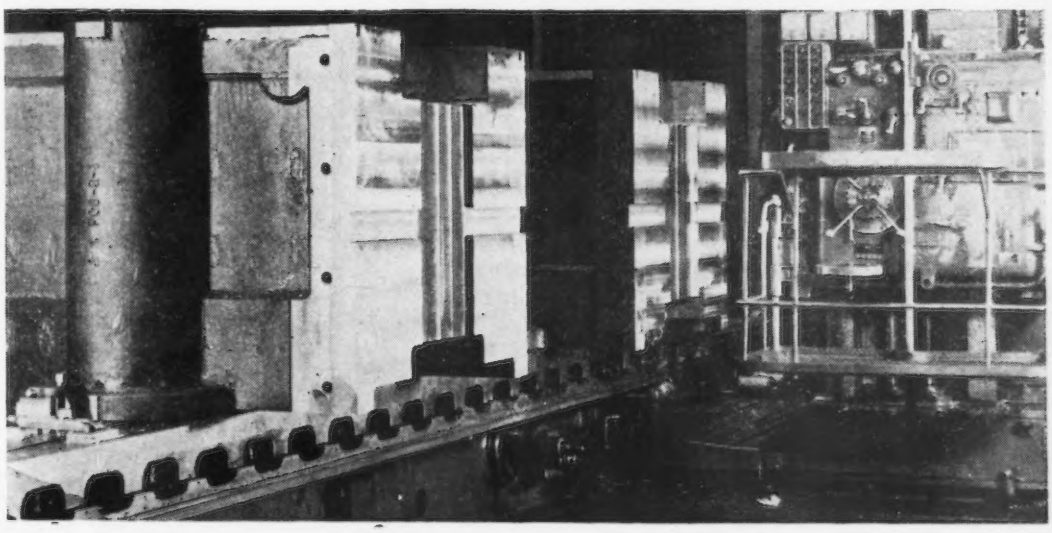

FIG. 22—Face milling operation on straight carbon steel weldments, using an 8-in. carbide cutter on a 30 hp Giddings and Lewis machine.

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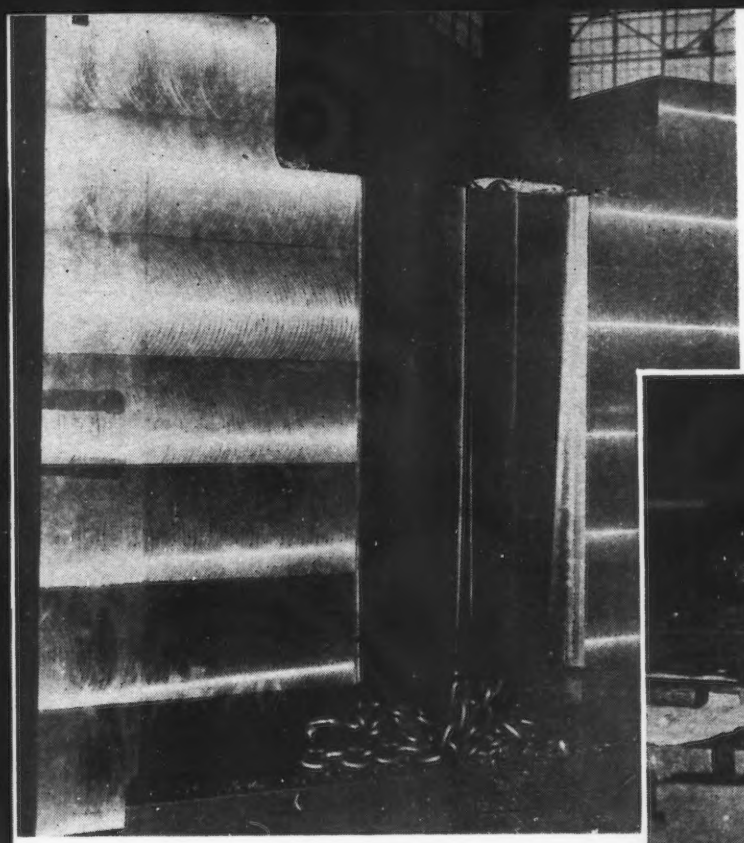
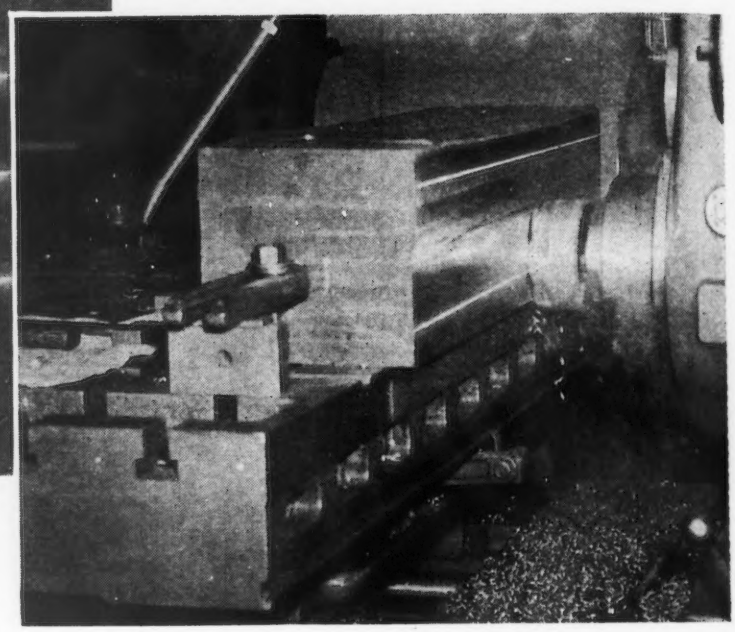


ABOVE

FIG. 23—Close-up of the finished face of the workpiece shown in fig. 22. Each pass is 5 in. wide and matches perfectly with the preceding pass.

BELOW

FIG. 24—Back-up plate for a die in which the surface is milled in several passes with perfect matching of the cuts and a great reduction in machining time over earlier methods.



satisfactory, as shown in fig. 23. The surface condition is particularly worthy of note. The matching is entirely satisfactory as indicated by a profilometer reading which does not indicate any appreciable difference in surfaces between the various lanes.

Finally, the time for this operation was reduced from 50 hr for planing to 8 hr for milling. This is possible, however, only where matching is satisfactory and where economical cutter life is possible.

The die block shown in fig. 24 presents another interesting example of carbide steel milling. This is a back-up plate for a die, and hence the carbon content is such that this component can be classed as straight carbon steel. Here again the essential problem in this milling operation revolves around the milling of a large area, leaving a satisfactory surface condition. In other words, it is necessary here to match 4 or 5-in. wide lanes, each milled in a single pass of the cutter. This was accomplished on a horizontal machine using a spindle speed of 240 rpm which with this cutter diameter presents a surface foot rate of 500 fpm. The table feed, or the rate at which the die block was moved to the cutter, was 20 ipm, and this in turn represents a chip load of 0.010 in. The horsepower consumed under these conditions is approximately 20 hp. The resulting finish shown in fig. 24 is not only acceptable but entirely unusual for this type of operation. Heretofore back-up plates such as this required time-consuming layouts on a planer where air is machined 50 pct of the time.

In this milling setup the blades in the cutter are assembled with the cutter mounted on the bar. Thus, again all inaccuracies in the bar, runout particularly, are eliminated.

As a final illustration for this discussion on the milling of straight carbon steels, the technique involved in preparing tool steel shanks will be discussed. This represents a step in the manufacture of carbide tools. These carbon steel shanks (usually of high carbon content—as high as 90) require the milling of large offsets.

This operation is performed on a 50 hp vertical milling machine, having in addition a 5 hp motor for the driving of the table. The limitation in this operation is, unfortunately, in the air vise which is used for holding several of these shanks. This limitation makes it inadvisable to use a feed rate greater than 25 ipm. The spindle speed is 275 resulting in approximately 576 sfpm for the 8-in. cutter. Since the depth here is 0.050 in., the power required is only a fraction of that available in the motor. The limitation referred to previously makes it inadvisable to use the full 60 in. of feed rate available in this machine or to mill more of these tool shanks in one pass.

Part 4 of this series on carbide milling will appear in the next issue.—Ed.

Previous articles in this series covering Carbide Milling were as follows:

Part 1—Fundamentals of Carbide Milling—Feb. 13, 1947

Part 2—Low Carbon Steel and Wrought Iron—Feb. 20, 1947

The Metallurgical Microscope—

Its Range and Use

The true working range of the metallurgical microscope is often distorted by photographic means, and the upper and lower limits of magnification are not well appreciated. The excellent results that can be expected with proper use of the apparatus are indicated in this article, wherein the author illustrates and discusses a series of photomicrographs — showing the same area of a steel specimen — ranging from 115X to 3900X.

By D. E. RODA

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IT is always advisable to photograph the image seen in the microscope. No two persons vision the same picture when they look into a microscope. The photomicrograph gives a permanent record of the structure and something that can be pointed to and discussed, and is much easier to look at than the image in the microscope. The photographic negative can also bring out details of the structure that cannot be seen by the naked eye.

The accompanying set of six photomicrographs shows the working range of the metallurgical microscope. From the first photomicrograph at 115X to the sixth at 3900X, the same area on the same piece of steel is shown. The steel is SAE 1060 plain carbon steel in the annealed condition. At the lower magnifications, the steel is seen to be made up of black areas of pearlite surrounded by a white network of ferrite or almost pure iron. As the magnification and resolving power are increased, the pearlite can be seen to be made up of laminations which, of course, are known to be alternate layers of iron and iron carbide (cementite). The higher magnifications also reveal that the structure is made up of poorly formed pearlite. Even within the same grain the laminations are oriented in several directions. This condition was produced by the rapid annealing of the steel by the induction heating method. In general, the lower magnifications are used to obtain an overall picture of the metal or material and the higher magnifications are used to study details of the structure.

In order to show the true working range of the metallurgical microscope all of the variables that change the magnification of a photomicrograph were held constant while the sample was photographed at the same location with five different objectives. The sixth photomicrograph used the same objective as the fifth but obtained a higher magnification through the use of a 25X eyepiece; a 10X hyperplane eyepiece is used in figs. 1 through 5. The Bausch and Lomb model MILS microscope with which these photomicrographs were taken has a 5 x 7 in. camera mounted in permanent alinement with the microscope. All of these photographs were taken on 5 x 7 in. film, using the full extension of the bellows, which is 525 mm. The photographs have been trimmed to 4½ x 6 in. to eliminate the marks of the film holder and identification code on the edges of the film.

When the full bellows are used, the image in focus is in balance with the plate size of the camera. The magnification of fig. 1 could be reduced to 50X or 25X by shortening the bellows of the camera. This might be thought of as an increase in the range of the microscope. However, the short bellows requires a very wide angle of light from the microscope lens to fill a 5 x 7 in. plate. As a result, only the center of the photograph is in focus. It is much better to have a 5 x 7 in. photomicrograph in focus at 115X than to have a 2½ or 3 in. diam circle in focus at 25X. The same amount of the specimen remains in focus in either case. Therefore, the working range of the metallurgical microscope can be thought of as having a practical minimum magnification around 100X. The range can be extended slightly by reducing the eyepiece from 10X, which was used in making the first photomicrograph, to a 5X eyepiece. A 5 x 7 in. photomicrograph at approximately 60X can be obtained by this change.

Each objective has magnification and resolving power, while an eyepiece has magnification power only. The standard eyepiece will magnify the image received from the objective from 5 to 25 times; however, it does not increase the resolving power. The lower range of the metallurgical microscope is very seriously limited. The limitations at low magnifications are en-

countered more often than the limitations at high magnifications, especially in the case of cast metals where the grain structure is often so coarse that an overall picture of the structure cannot be obtained even at the lowest possible magnifications. Leaded bronzes, brasses and aluminum are usually examined in the lower range of magnification. Cast aluminum often has a grain size as coarse without magnification as that seen in the steel sample in fig. 1 at 115X.

The magnification range and resolving power of the microscope are increased by changing the objective lens. The photomicrograph, fig. 2, using a 10.25 mm objective, has a magnification of 425X. In practice, the gap in magnification between the objective is smoothed out with eyepieces which come in 5X, 7.5X, 10X and 12.5X magnifications.

Fig. 3, at 710X, is taken with a 5.5 mm objective, which is intended for use with a special 10X amplifier eyepiece that has a highly corrected negative lens to flatten the image for photographic work only. The amplifier eyepiece was not used in this picture, in order to eliminate one additional variable. Fig. 4 is a photomicrograph taken with a 4 mm apochromatic objective. This lens is corrected for three wavelengths of light, which is the finest type of microscope objective. There is a marked increase in resolving power and magnification in this photomicrograph as compared to the previous one. Special compensating eyepieces are required for the apochromatic objectives to give a wide, flat field. However, here again the hyperplane 10X eyepiece was used.

The photomicrographs, figs. 5 and 6, were taken with a 2.75 mm oil-immersion fluorite objective. The use of oil in place of air between the specimen and the objective and the use of fluorite for the lens in place of optical glass, change the refraction of light and enable this lens to gather in more light for examination and photographing the very small area on the work piece that is seen at these very high magnifications. The 2.75 mm objective with the 10X hyperplane eyepiece and full bellows gives a magnification of 1560X. Also, an increase in resolving power can readily be seen with the 2.75 mm objective over the 4 mm objective. In the sixth photomicrograph, the magnification is increased two and one half times over the fifth photomicrograph to 3900X by using a 25X compensating eyepiece in place of the 10X eyepiece. Although it is easier to examine the small details of the laminations at the higher magnification, there is no increase in resolution of the details of the structure from the fifth to the sixth microstructure. It is possible to increase both the resolving power and magnification one step farther through the use of either a 1.8 mm fluorite oil-immersion objective or a 1.8 mm apochromatic oil-immersion objective. These objectives would give a magnification of approximately 2000X with the 10X eyepiece and 5000X with the 25X eyepiece. Therefore, the practical range of the metallurgical microscope may be considered to be 100X to 2000X and the extended range 25X to 5000X. A world of information is yet to be learned about the structures and behavior of metals and materials with the aid of the great magnification of the optical microscope.

All of the photomicrographs in this set can be photographically enlarged up to three times for visual examination before the images become too coarse to be sharp. This would multiply the magnifications by three and give some very high values of magnification.

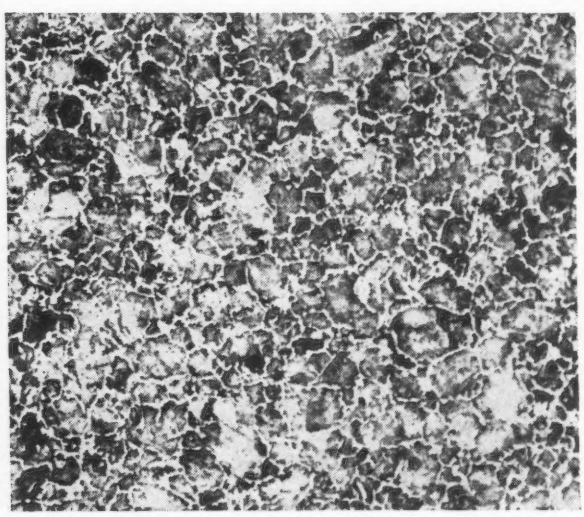


FIG. 1—115X, 32 mm achromatic objective.

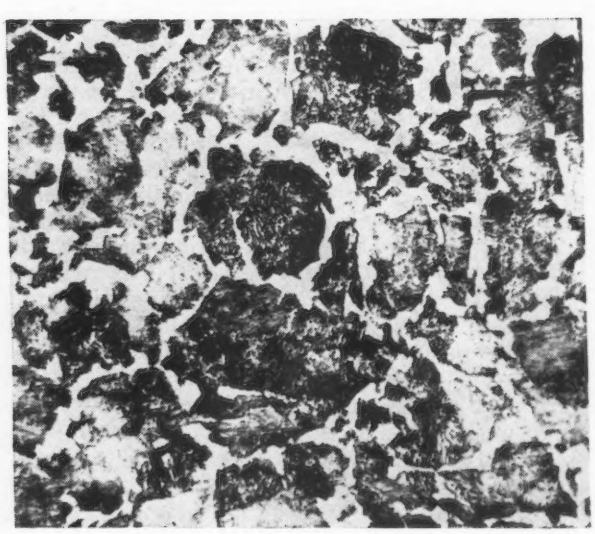


FIG. 2—425X, 10.25 mm achromatic objective.

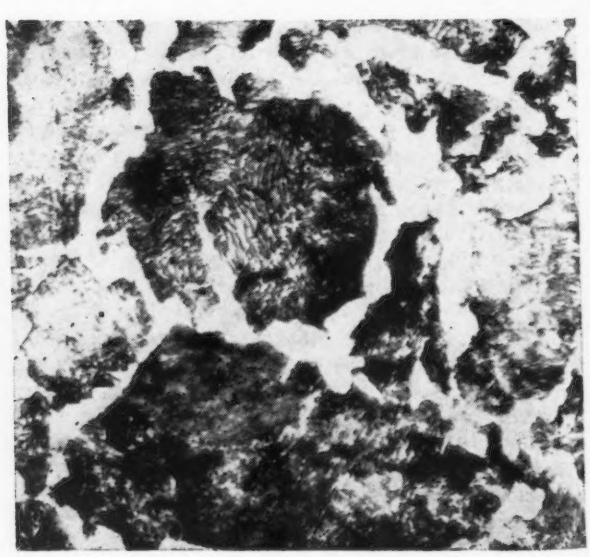


FIG. 3—710X, 5.5 mm achromatic objective.

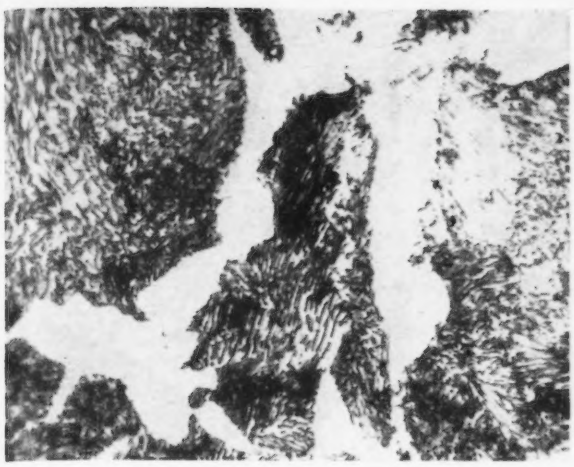


FIG. 4—1200X, 4 mm apochromatic objective.

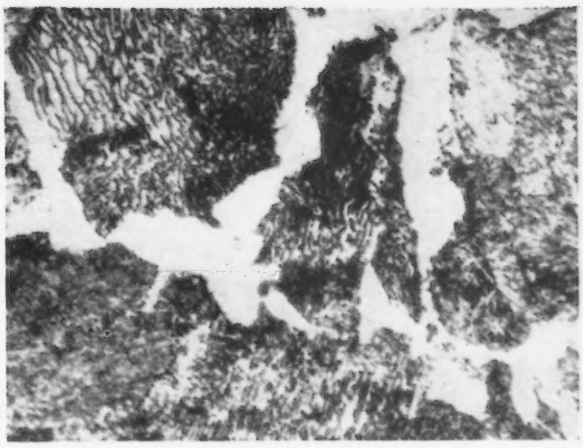


FIG. 5—1560X, 2.75 mm fluorite objective.

FIG. 6—3900X, 2.75 mm fluorite objective, 25X compensating eyepiece.

However, these values should be considered as enlargements and not as an increase in the range of the microscope. Also, the photomicrographs may be further enlarged several times for murals or by projecting the images from lantern slides. These enlargements retain their sharpness and satisfactory appearances provided that the distance from which the image is viewed is increased in proportion to the magnification of the image. Obviously, the enormous magnification obtained by these methods is the product of the magic lantern as well as of the microscope.

Usually, two photomicrographs are sufficient to show what is important in any structure; the first at a low magnification to give an overall picture of the material, and the second at a higher magnification to illustrate interesting features in the structure. It would take at least three of the views from this set to give a true picture of the complicated structure of this steel. If a series of steels or other metals are periodically examined for the same thing, such as machining quality, it is always advisable to standardize on one magnification, say 100X, and take at least one photomicrograph at this magnification even though the structure may not be suited to this magnification. The observer will then be able to quickly compare the structures obtained over a long period of time and pick out any unusual condition.

Each problem is different. The metallographer must examine the specimen at various low magnifications and decide which is the best to give a true picture of the metal. This might be 50X or 500X depending upon the fineness of the structure. Then the specimen should be examined at a high magnification to see if any further information of interest can be obtained.

In the effort to obtain photomicrographs at standard, even magnifications of 50X, 100X, 250X, 500X, etc., the bellows are shortened, and the advantages of obtaining large photomicrographs like those shown here are often overlooked or forgotten.

Effect of Metallurgical Factors on Machinability

RESULTS of an extensive investigation into metallurgical problems encountered in gear cutting are discussed in an article entitled "Some Metallurgical Factors Which Affect Machinability,' by K. J. B. Wolfe, published in *Metal Treatment*, London. The investigation, which stresses particularly intermittent cutting operations, covers micrographic studies, tensile tests, hardness tests, X-ray, magnetic and internal stress determinations.

Observations were made of the temperature developed by the cutting edge and on the temperature of the chips. The author discusses at some length a heat treatment which is said to improve the machinability of steel without materially affecting its mechanical properties. This treatment consists of double tempering and oil quenching hardened steel, the second tempering being approximately 45°F lower than the first. Water hardened steels, it is pointed out, do not respond to the same extent as do the oil hardened types. The higher alloy steels appear to give a greater improvement in machinability by this treatment than do the lightly alloyed and straight carbon types. This improvement is most noticeable under heavy duty machining conditions.

Metallurgical Applications of The X-Ray

THE use of the X-ray diffraction spectrometer for chemical analysis (as compounds or minerals) was demonstrated in this investigation by making diffraction curves on samples of an aluminum brazing flux and on two stainless steel welding rod coatings. A copper target X-ray tube was used for these analyses. The flux was analyzed in the powdered condition as-received and in the solidified condition after melting and operation for some time. Slight differences were noted, probably due to the loss of water of crystallization and pickup of impurities. The curves made on these samples indicated that the flux was composed chiefly of sodium and potassium chlorides with smaller amounts of magnesium and calcium chlorides and some indications of the presence of cryolite (Na_3AlF_6). These are shown in figs. 20 and 21. To demonstrate the difference between the iron and the copper target X-ray tubes, two curves were made on the same aluminum brazing flux sample, figs. 21 and 22. These samples were analyzed over the range of 20° to 85°.

Identification of the minor constituents is difficult in the curves shown, but by careful scanning of the questionable areas by means of the Geiger counting unit, the accurate location of minor lines is possible, thus permitting identification of these constituents, except, of course, where the minor constituents are in such low concentration that their major lines cannot be distinguished from the background radiation. This degree of accuracy in analysis was not attempted in this investigation, since the purpose was to indicate the possible applications of the equipment.

In parts one and two, THE IRON AGE, *Feb. 13, Feb. 20, 1947, respectively, the author described the operation of the X-ray diffraction spectrometer and presented diffraction curves showing effects of heat treatment and cold working on diffraction patterns.*

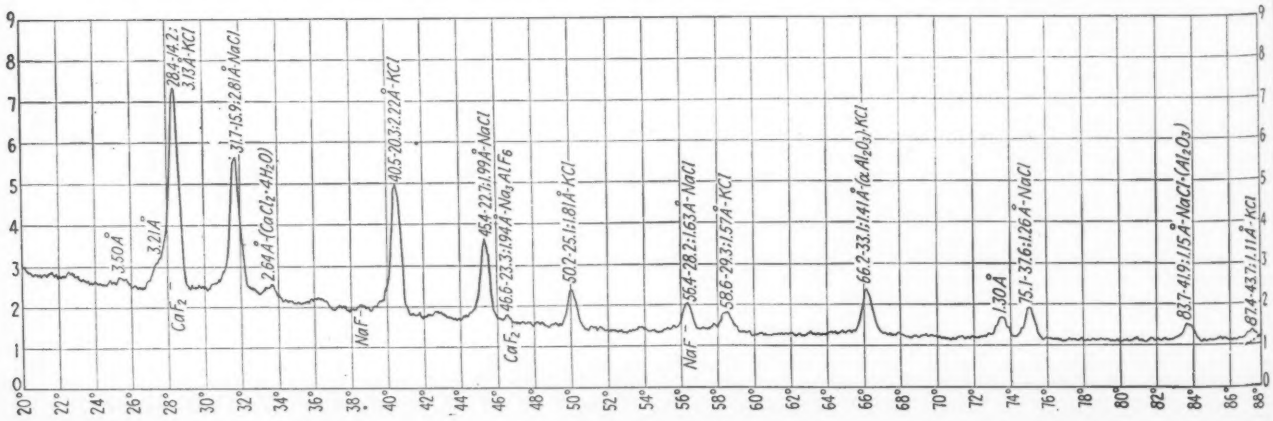
The diffraction curves of the welding rod coatings are shown in figs. 23 and 24. Copper radiation was used and the recorder intensity and damping controls were set at 30 and 80, respectively. The coating identifications from rods of two different manufacturers are as follows: (1) rod A, fig. 23, type 347, ⅛ in. all position, reverse polarity rod, and, (2) rod B, fig. 24, type 347, ⅛ in. reverse polarity rod.

Examination of the curves produced indicated that the commonly called lime coatings were composed chiefly of calcium carbonate (as calcite) and calcium fluoride with an indication of aluminum sulphate in the coating from rod A and iron oxide (ferrous oxide) in rod B coating. As in the case of the brazing flux, complete analysis was not attempted since only an application of the method was desired.

Discussion of Results

X-ray diffraction analysis should not be considered as a substitute for spectrographic and chemical analysis, because it definitely cannot take the place of either of these methods. However, for certain applications, especially those which are influenced by the crystalline structure and characteristics of the material, X-ray diffraction analysis offers a valuable companion analytical instrument. While chemical and spectographic methods determine the elements present in the sample, X-ray diffraction analysis determines the chemical compounds, phases, or minerals in which the elements are combined. For such applications as the determination of alloy phases and constituents, the X-ray diffraction equipment has no equal. However, prior to the development of the Geiger tube spectrometer, the numerous shortcomings of the photographic recording equipment made X-ray diffraction equipment practicable only for specialized research work because of the necessity of highly skilled specialists for its operation and interpretation. The spectrometer and the

FIG. 20—Diffraction curve of an aluminum brazing salt in the as-received condition, using copper K radiation. I=25, D=70.



Diffraction Spectrometer

By JOHN L. ABBOTT
Senior Metallurgist, Wright Aeronautical Corp., Wood-Ridge, N. J.

The versatility of the Geiger counter X-ray spectrometer is further emphasized by the author in this, the concluding part of a three-part article, by presenting chemical analyses of an aluminum brazing flux and two stainless steel welding rod coatings, in the form of diffraction patterns. A critical discussion regarding the use of the X-ray diffraction spectrometer as compared with chemical and spectrographic analysis is also presented

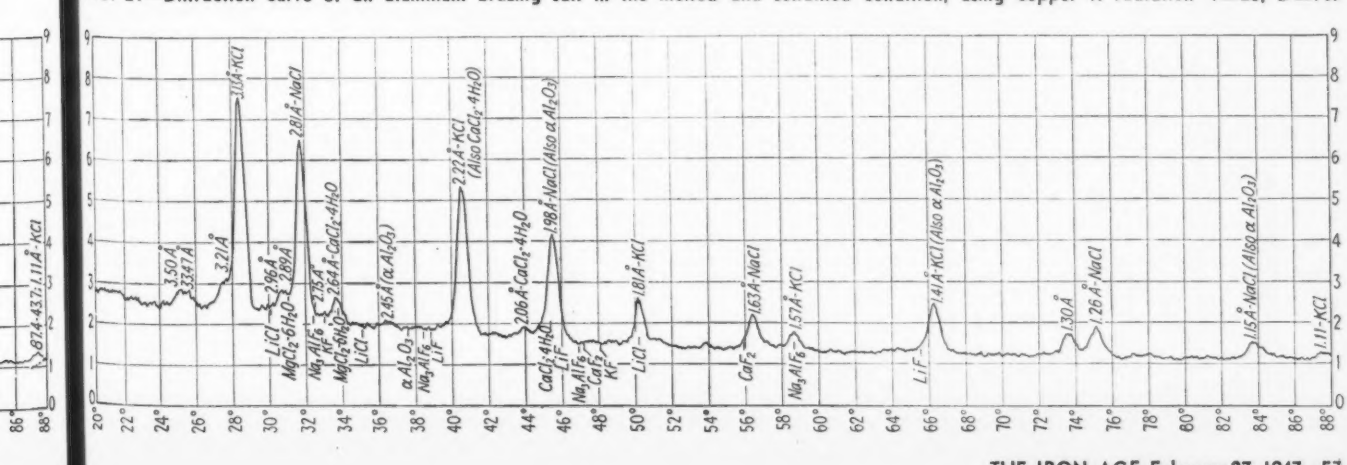
coupled electronic recorder have replaced the specialist to considerable extent by producing the X-ray diffraction spectra on a highly magnified and readily interpreted chart showing line intensities v. diffraction angle. Since the usual inspection and control type analysis is dependent upon the intensity and position of a few major lines in the X-ray pattern, the time required for the exposure and production of the recorded pattern has been reduced from hours to minutes. The time required for interpretation of the diffraction pattern has also been greatly reduced by elimination of the time-consuming visual or densitometer determination of line positions and intensities, and the necessity for calculation to compensate for errors introduced by inconsistencies of photographic film characteristic exposure limits, film speeds, and sensitivities, variations in development procedures, and the other allied variables of photographic reproduction.

Mr. Abbott, the author, is now Application Engineer, Industrial X-Ray Div., North American Philips Co., New York.—Ed.

The strip-chart record produced by the spectrometer and the electronic recorder eliminates the errors of photography and produces an easily interpreted graph of line intensities v. diffraction angle. The heretofore complicated analysis of photographic film records becomes a relatively simple operation of determining the d values of the major lines in the diffraction pattern by the use of available tables showing the spacings corresponding to the diffraction angles for the various X-ray tube target materials. Thus the interpretation of the diffraction pattern consists of location of the compounds which have the same characteristic crystallographic spacings revealed by the recorded lines, by means of the ASTM Index of X-ray diffraction spectra.

A discussion of the limitations of X-ray diffraction analysis should also be made. The most significant restriction to analysis is the relatively low sensitivity in detecting minor constituents in a mixture. The components must be in sufficient quantity that the most intense spectrum lines will exceed the background radiation. Reports place this concentration at between 1 and 5 pct. Also, for exact analysis, minor constituents must not be hidden by the intense lines of the major constituents. While these are disadvantages in analytical work, for metallurgical analysis the presence of low percentage components is usually detected and analyzed by their effect on the pattern of the chief component phases. The fact that X-ray diffraction analysis is efficient for concentrations above about 1 to 5 pct

FIG. 21—Diffraction curve of an aluminum brazing salt in the melted and solidified condition, using copper K radiation I=25, D=70.



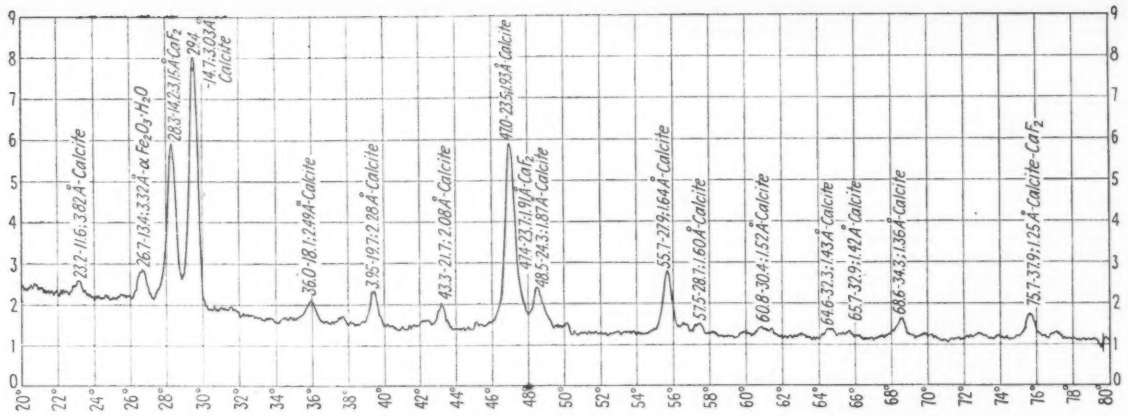


FIG. 22—Diffraction curve of an aluminum brazing salt in the melted and solidified condition, using iron K radiation rather than copper (as shown in fig. 21). I=50, D=70.

makes it a valuable companion instrument for the spectrograph, whose upper effective limits are approximately the same as the lower limits of the X-ray diffraction spectrometer.

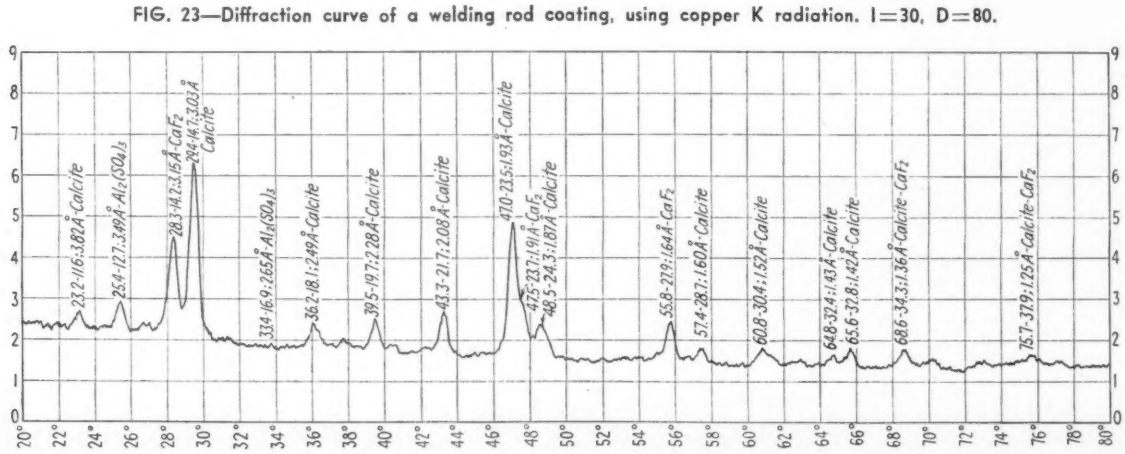
Another disadvantage of the spectrometer used by the writer is the inconsistency in the diffraction pattern caused by the orientation resulting from cold working. As mentioned previously, the newly developed specimen holder which permits rotation of the specimen would permit determination or elimination of the effects of orientation. The present specimen holder limits the specimen to approximately 1 in. in diameter by ¼ in. in thickness. The use of the equipment for larger specimens and for complete parts would necessitate some developments in the specimen holder.

In addition to the metallurgical uses enumerated in the beginning of this report, the X-ray diffraction spectrometer offers a new means of nondestructive inspection analysis for semifinished and finished parts of such size and shape as could be placed in the specimen holder. By the development of suitable fixtures for holding the parts in the X-ray beam, the range of possible uses is wide. Such procedures would require the establishment of standards, and analysis would necessarily be on a comparative basis. While a metallographic finish on the specimen is required for accurate determination of the diffraction pattern, it is probable that the determination could be made on finish ground or polished surfaces, making allowances for the cold-worked surface.

The use of the X-ray diffraction spectrometer in conjunction with established inspection and analytical methods can be applied to many of the procedures now used, such as chemical and spectrographic analysis, metallurgical and metallographic examination, and physical testing procedures. In conjunction with established methods of X-ray inspection, the spectrometer should provide information on materials and parts which now cannot be determined without injuring or destroying the part.

The applications of X-ray diffraction equipment to the development and fabrication of heat resisting alloy parts presents a field of application which should not be overlooked in the newly opened field or jet propulsion, gas turbine, and rocket developments. Such uses as the determination of phase changes, precipitation of constituents, and grain growth during fabrication and during operation, present applications where this equipment should prove to be of value. In the field of such materials as the high alloy steels and the high temperature resistant alloys, particularly those which have been recently developed, the metallurgical and metallographic properties are not well known. For such uses the X-ray diffraction analysis offers a new means of obtaining the necessary information. The possible uses of X-ray diffraction for quality control and material inspection include the detection

FIG. 23—Diffraction curve of a welding rod coating, using copper K radiation. I=30, D=80.



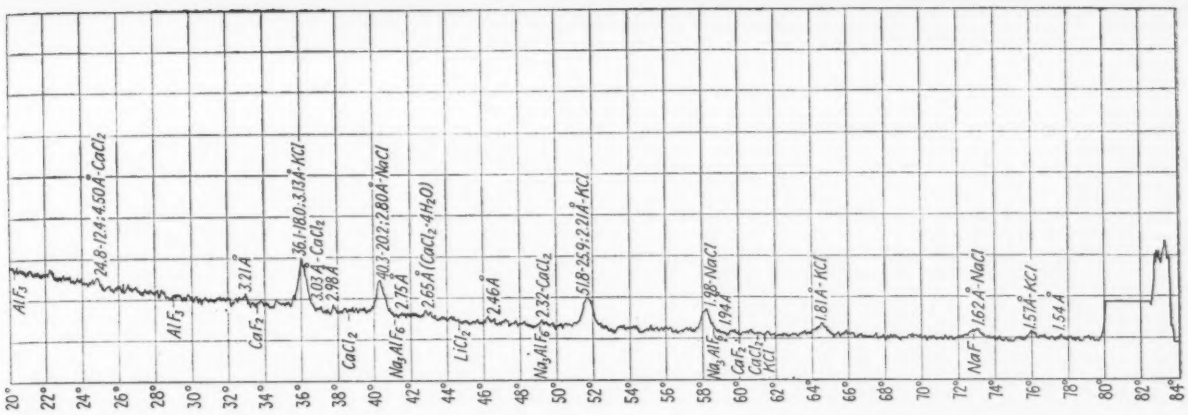


FIG. 24—Diffraction curve of a welding rod coating different from that shown in fig. 23, using copper K radiation. I=30, D=80.

of improper carburization or decarburization (particularly on such parts as valves, springs, flat springs, sheet stock parts, etc.), grinding burning or overheating on finish ground parts, improper heat treatment or complete absence of heat treatment, and material substitution.

Other applications which should be practicable include the determination of segregation and phase distribution in bearing materials, distribution of particle sizes in powdered metal products, and analysis of nonmetallic products such as rubber, plastics, gasket materials, protective coatings, and numerous other nonmetallic materials.

The author wishes to acknowledge the assistance rendered by Lillian Baeder and James Keeler of the Wright Aeronautical Corp. materials laboratory in preparing photomicrographs of the metallurgical specimens.

Bibliography

J. S. Buhler, "X-ray Diffraction—An Industrial Tool," Metals and Alloys, November 1944.

H. Friedman, "Geiger-Counter Spectrometer for Industrial Research," Electronics, April 1945.

F. G. Firth, "X-ray Diffraction—Basic Theory, Principles and Applications," Petroleum Refiner, April, May and June 1945.

J. S. Buhler, "Engineering-Design Development of the X-ray Diffraction Spectrometer," Electrical Engineering, June 1945.

F. G. Firth, "The Geiger-Muller X-ray Spectrometer," presented before the Fifth Annual National Meeting of the American Industrial Radium & X-Ray Society, Marquette University, Milwaukee, Nov. 10, 1945.

E. S. Kopecki, "Geiger Counter Used in Powder Metallurgy," THE IRON AGE, Feb. 28, 1946.

New Magnetic Alloy Opens Way for Lightweight Motors

A NEW alloy, 35 pct Co, 64 pct Fe, and 1 pct Cr, that carries more magnetism than any other alloy practical for use in motors and generators and is tough enough to withstand intense vibration has been developed by Dr. Trygve D. Yensen of the Westinghouse Research Laboratories in collaboration with J. K. Stanley. The new alloy, Hiperco, will make possible compact electric motors and generators an estimated 10 pct smaller and lighter than those of equal power now built for aircraft. This is possible because the high magnetic saturation point of Hiperco will permit the design of motors with less metal for the same power, or more power from the same amount of metal.

The combination of 35 pct cobalt with iron gives the highest magnetic saturation point of any known metallic material, and the 1 pct chromium is added to make the alloy workable.

The new alloy is the result of 20 years' research with the final difficulty of brittleness being overcome only recently. Earlier samples of Hiperco were too brittle to be extensively used. Mr. Stanley, however, devised a method of rolling which enables production of a tissue-thin strip of metal tough enough to withstand intense vibration and yet ductile enough to be bent double without breaking.

Formerly the metal was hot rolled and allowed to cool slowly, but unlike ordinary iron and steel, cobalt-iron becomes brittle when it cools in this manner. It has been found that brittleness can be avoided either by quenching the alloy in cool water or by continuous rolling, while the hot metal cools.

Now, with the quenching method in use, Hiperco ingots are rolled into slabs 2 to 3 in. thick, reheated to a high temperature, and rolled again to a thickness of 0.1 in. As the strip emerges from the last set of rolls, it plunges into a trough of cooling water.

The sudden cooling makes the metal so strong and workable it can be coiled like wire, whereas formerly it could not be bent at all. The cool metal then goes through a cold rolling process which can further reduce its thickness to as little as 0.0005-in. For most motor and generator applications, however, thickness of approximately 0.005-in. is sufficiently thin.

Even though cobalt is a high cost material, most of which must be imported from Africa, Hiperco will be of value wherever smaller and lighter motors and generators are economically important.

Mineralogists now are searching for new supplies of cobalt in the United States, Canada and China. If they should find a sufficient supply, Hiperco might replace other metals in many types of motors and generators. Today, however, its cost limits its use to such applications as aircraft, where savings in weight and size are important from an operating cost standpoint.

To increase production facilities for this metal, an improved type, small rolling mill is being installed at the Westinghouse Research Laboratories to perform the cold rolling part of the process.

This mill actually will have a small-scale production capacity of more than 1,000 lb a day and will provide enough Hiperco to meet early needs.

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FIG. 1 — Repairing of buckled roofing sheets was simplified by use of blind rivets. Insert shows the rivets installed with umbrella plugs to waterproof the job.

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Practical Applications of Blind Riveting

By MILO KETCHUM
Chief Engineer,
Cherry Rivet Co., Los Angeles

The technique of blind riveting found many wartime uses and in peacetime is also being applied to many diversified applications where it is difficult if not impossible to buck a solid rivet. This article describes a number of unusual uses for blind rivets, such as repairing loose roofing sheets, attaching door hinges to stainless steel refrigeration units and installing metal insulation retainer sheets in inaccessible locations.

BLIND riveting came into general use in answer to the wartime demand of the aircraft industry for a method of riveting in spots where it was either difficult or impossible to buck a solid rivet. The fact that blind rivets are upset by a pull rather than a blow and the fact that the shank expansion of these rivets is controlled led to their use in places not necessarily blind. Soft and pliable materials can now be riveted, where formerly the shank of an ordinary rivet would buckle or tilt, due to lack of support of the shank. Likewise, delicate materials that shatter under the violent blows of a pneumatic hammer or riveting gun can be successfully riveted. Some interesting applications of blind riveting are detailed in this article.

The Maine-Machine Works, Ltd. had a problem that blind riveting solved very nicely. The corrugated steel roof of their plant had buckled slightly at the sheeting joints. Wind and rain coming through these openings were extremely bothersome and something had to be done to correct this fault. The company's first thought was to erect scaffolding on the inside of the building and to bolt these seams together. This would have been an expensive process and would have interrupted production in the plant. Instead of this, it was decided to use hollow blind rivets with umbrella type plugs installed from the top of the roof. As shown in fig. 1, the corrugated roof was completely weatherproofed.

Hodge Sheet Metal Products Co., working on ship building and ship fitting jobs, found that blind riveting had a number of interesting applications in their work. One of the first problems that blind riveting solved was that of fastening light gage perforated aluminum insulation retainer sheets to the sides, bulkheads and overheads, as shown in fig. 2. Previously screws had been used, but the vibration of the ship caused the screws to work loose. Riveting was obviously the answer, but conventional riveting posed a

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FIG. 2 — Installing perforated aluminum insulation retainer sheets to the structure in a normally inaccessible location.

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BELOW

FIG. 3—Fastening door hinges on stainless steel refrigeration units.

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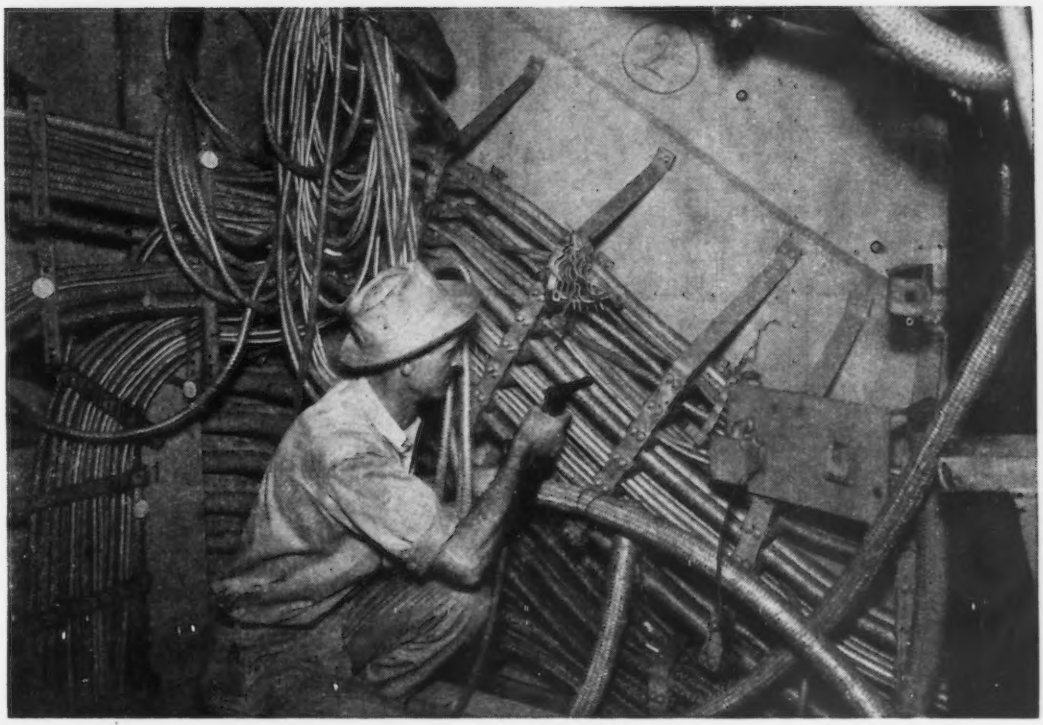

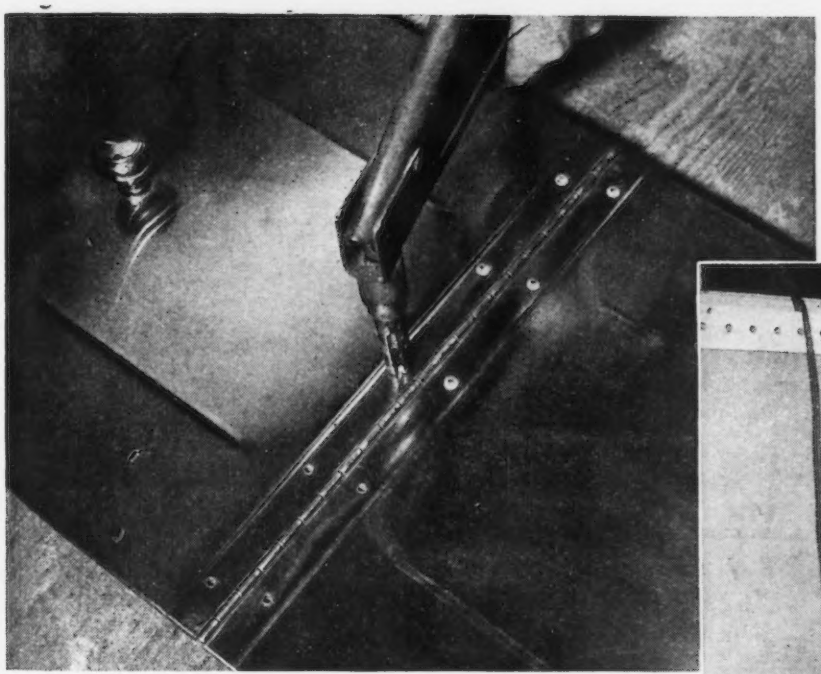

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FIG. 4—Use of a hand gun and blind rivets simplifies the replacement of damaged metal panels.

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difficult access problem. An investigation was undertaken and it was found that faster, easier fastening was possible with blind rivets. The results of this application led the company to investigate the possibilities of blind riveting on other jobs. Self-plugging blind rivets were used to attach radiator supports to bulkheads and for installing piping collar plates. Blind rivets were also used to attach backing plates for compartment labels where welding would cause distortion of the bulkhead or doors. Vermin proofing guards were attached to lockers, desks, etc., and stainless steel sheets in the refrigerator compartments were fastened with blind rivets, as illustrated in fig. 3.

Numerous bus and truck companies have been faced

with the problem of reducing out-of-service time on units that have come into their shops for repairs. Among others, the Los Angeles Transit Lines have been using blind riveting to speed up body and fender repairs. In commenting on the use of blind riveting for this type of operation, an official of the lines reports that blind riveting reduces riveting to a relatively simple, one-man operation. It has proved extremely useful in those very inaccessible places where it was formerly necessary to use self-tapping screws. Fig. 4 illustrates the use of blind rivets for repairing a bus panel. Over a period of time the Los Angeles Transit Lines have found that by using blind riveting techniques they can save approximately 50 pct of their former time on jobs of this nature.

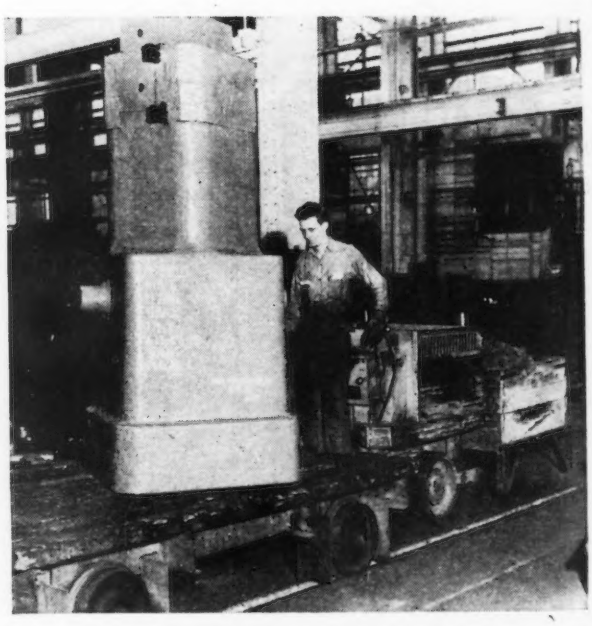
A manufacturer of high speed centrifugal blowers used for spraying trees required a method of fastening the blades on these blowers (52 to 120 blades per machine). The use of conventional rivets was the accepted method, but wherever they were used, it was always necessary to rebalance the wheel after the rivets had been bucked. By assembling these blowers with hollow pull-through rivets the actual assembly time was reduced and the task of rebalancing the wheel was eliminated. Tests showed that by using the gentle pulling methods of pull-through riveting the symmetrical trueness of the wheel was maintained. A time study further proved that a total of over 6 man-hr per assembly had been saved by using these fasteners. Blind riveting is also finding growing application in the production of prefabricated sheet metal housing.

Platform Trucks Speed Material Flow In Forge Shop

ACQUIRED to complement an existing system of material handling by overhead cranes and manually-moved small trucks, two storage battery-powered lowlift platform trucks, each of 6000-lb capacity, have improved material movement and placement in the plant of the Erie Foundry Company, Erie, Pa., manufacturers of forge shop machinery.

Miscellaneous handling of work in the shop, as well as the handling of incoming raw material and outgoing product, and the removal of scrap material are among the tasks that these two industrial trucks perform each day. The company's plant consists of four bays, all serviced by overhead cranes. Due to expansion of its plant in the early years of the war, some material in process flow at the plant had been moved into and through production by manually-operated trucks, or by the system of overhead cranes. For the large pieces, too heavy for movement by hand, the latter method was found to be wasteful of time, while production also suffered. Movement from the main high bay on the north side to an adjacent point in the west bay—a distance of 50 to 75 ft—had to be accomplished by movement of a crane to the west bay and transfer to the crane system there. Other cranes, serving the north bay, were prevented from operating while the movement was under way.

With the installation of the battery-powered trucks, pieces too heavy for manual movement, which consequently had been moved by crane as described above, were easily moved between bays by means of convenient cross aisles. This resulted not only in a saving



in time, but also in the elimination of the costly tying up of the crane systems. Laying of rails from the outside yards into the plant, these systems cutting across the south and north bays at several points, permitted easy movement of huge parts of machines on transfer cars. Such cars, bearing loads of 25 tons or more, now are moved and positioned easily and accurately by the platform trucks, as shown in the accompanying photograph.

In addition, small parts and pieces are moved into position adjacent to work areas, or into temporary sotrage, in bin-skids or on flat-top skids. Patterns and billets of metal are moved on trailers which are either pushed, or pulled, by the platform trucks, sometimes while the latter are carrying a load on the platform. Parts, or pieces, weighing up to approximately 7000 lb, are moved into the shipping area, packaged, and taken into outward shipment by means of the trucks as well.

10,000 Trade Names

. . . The ninth section of the Trade Name Directory, compiled by THE IRON AGE as a ready reference for engineers and business executives, is presented herewith. Previous sections of this directory appeared in the issues of Jan. 2, p. 172; Jan. 9, p. 65; Jan. 16, p. 64; Jan. 23, p. 63; Jan. 30, p. 60; Feb. 6, p. 69; Feb. 13, p. 66; Feb. 20, p. 62. This directory tells what a trade name covers, its composition if a material, where or how it is used . . and the full address of the manufacturer or supplier.

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(Continued)

3B Lubricant: Compound for oil dilution for difficult tapping, threading, piercing, stamping, blanking and similar operations on steel. Wayne Chemical Products Co., Detroit 17.

3-M Adhesives: Complete line of sealers, insulators, protective coatings and industrial cements. Minnesota Mining & Mfg. Co., 900 Fauquier Ave., Saint Paul 6.

Three-M-ite: Aluminum-oxide abrasive. Clover Mfg. Co., Norwalk, Conn.

Thriftmaster: Multiple-spindle drill heads. Thomson Industries, Inc., 31-05 Review Ave., Long Island City, N. Y.

Throttltrols: Automatic valve positioners. Wheelco Instruments Co., Chicago 7.

Thruray: Instrument using ultrasonic principles to obtain nondestructive testing results in clad, plated, or bonded metals, or laminated sheets. Sperry Products, Inc., 15th & Willow Ave., Hoboken, N. J.

Thrustfre: Multi-stage centrifugal pumps. Pennsylvania Pump & Compressor Co., Easton, Pa.

Thur-Ma-Lox: Black and aluminum coatings for metals at temperatures up to 1200°F. Dampney Co. of America, Hyde Park, Boston 36.

Thur-White (Green): Heat-resisting, fire-retarding durable, adherent paint films; for hot metal surface to prolong life, for identifications, etc. Thurmalox Co., Doylestown, Pa.

Thy-Mo-Trol: Electronic stepless speed control for motors, machine tools, etc. General Electric Co., Schenectady.

Ticonal: A European-made permanent-magnet alloy, identical to Alnico V. General Electric Co., Schenectady.

Ticonium: Complex alloy with Ni-Co-Cr-Mo-Be for bone surgery. Consolidated Car Heating Co., 415 N. Pearl St., Albany.

Ticrank: Alloy steel for crank shafts. Titusville Forge Co., Titusville, Pa.

Tieco: Standard or special foundry ladles, bowls, shanks and tongs. Industrial Equipment Co., Minster, Ohio.

Tiger Brand: Steel wire rope and strands; wire rope slings. American Steel & Wire Co., Cleveland 13.

Tiger Bronze: Bronze bearings and castings. American Brake Shoe Co., 230 Park Ave., New York 17.

Tiger Bronze: Copper alloy for engine castings and bearings. More-Jones Brass & Metal Co., 4930 Manchester St., St. Louis.

Tiger-Claw: Wire rope sockets. American Steel & Wire Co., Cleveland 13.

Tiger Grip: Industrial work gloves made of knitted material; water repellent. Advance Glove Mfg. Co., 901 W. Lafayette Blvd., Detroit 26.

Tigerloy: Impact resistant Ni-Mo iron alloy for castings. Massillon Steel Casting Co., Massillon, Ohio.

Tigerweld: Signal bonds and rail bonds. American Steel & Wire Co., Cleveland 13.

Tile-O: Cleaner for tile. Turco Products, Inc., Los Angeles 54.

Timang: Austenitic, wear resisting steel with Mn-Ni for welding rods for welding high Mn steels, commercial castings. Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Time-Current: Method of acceleration for dc motors. Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland 4.

Tinea: Anti-friction metal for bearings. Compagnie Francaise de l'Etain, Paris, France.

Tin-Free Bronze: 7 to 8 pct antimony, 1.5 to 2.5 nickel, remainder copper; for worm gears. Hamilton Gear & Machine Co., 76 Van Horne St., Toronto, Canada.

Tinicosil: Copper-zinc alloy with Ni-Pb for screw-machine parts, forgings, hardware, plumbing. Titan Metal Mfg. Co., Bellefonte, Pa.

Tinidur: 0.15 C, 30 Ni, 15 Cr and 1.8 Ti high-temperature alloy for gas turbines. Friedrich Krupp, A. G., Essen, Germany.

Tinite: Hard and tough lead-antimony-tin for bearings. Ajax Metal Co., 46 Richmond St., Philadelphia.

Tinol Solder: Complete solder in paste form containing its own flux; used with torch or soldering copper on all metals except aluminum. American Solder & Flux Co., Trenton Ave. & Norris St., Philadelphia 25.

Tintite: For tinning babbitt lining to bronze, steel and iron shells. United American Metals Corp., 200 Diamond St., Brooklyn 22.

Tisco: Series of stainless steels and irons for heat and corrosion-resistant parts. Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Tisco: Series of medium-carbon steels for commercial castings, railway track switches, machine parts. Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Tiscor: Low-alloy high-tensile steel with good welding properties. Tata Iron & Steel Co., Ltd., Jamshedpur, India.

Tiscrom: Low-alloy high-tensile structural steel. Tata Iron & Steel Co., Ltd., Jamshedpur, India.

Tiska Nirosta: Series of austenitic chrome-nickel steels with varying C and Mo content, for valves, fittings, marine parts. Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Titan: Speed reducers. Foote Bros. Gear & Machine Corp., 4547 S. Western Blvd., Chicago 9.

Titan Bronze: Non-corrosive bronze with Fe and Al for gears, pinions, roller bearings. Titan Metal Mfg. Co., Bellefonte, Pa.

Titan Bronze Welding Rod: 60-40 brass with 0.6 Sn, for welding rods. Titan Metal Mfg. Co., Bellefonte, Pa.

Titanium Dioxide: High dielectric-constant materials and various metallic titanates employed as dielectric material in electrical condensers. General Ceramics & Steatite Corp., Keasbey, N. J.

Titeflex: Metal hose. Titeflex, Inc., 501 Frelinghuysen Ave., Newark 5, N. J.

Tite-White: Regular and acid-resisting porcelain enamel for metal products. O. Hammel Co., Pittsburgh.

Tobin Bronze: Bronze with Pb, Zn and Fe for welding wire, seamless tubes, condenser tubes and steam and seawater valves. American Brass Co., Waterbury, Conn.

Tocco: Process of induction heating for hardening, brazing, annealing, heat treating, forging or forming of metallic parts. Ohio Crankshaft Co., 3800 Harvard Ave., Cleveland 1.

Toggle-Bug: Portable drill for holes up to 1.5 in. diam. Guibert Steel Co., 1716 Youghiogheny Ave., Pittsburgh.

Toledo: Weighing and counting scales in all capacities; balancing, testing and force-measuring devices. Toledo Scale Co., Toledo.

Toledo Alloy: Alloy steels for mining equipment, carburized parts, pug mill parts, paddles, dies. Industrial Steel Casting Co., 2243 Waterworks Drive, Toledo.

Tomahawks: Heavy-duty two-purpose tool for removing slag from welds by means of chisel or cone chipping head or wire bristle brush. Atlas Welding Accessories Co., 14824 Wyoming Ave., Detroit 21.

Tombasil: 82-14 copper-zinc with 5 Si for screw-machine parts. Ajax Metal Co., 52 Richmond St., Philadelphia.

Tombasil: 91 Cu, 4.5 Si, 4.5 Zn, silicon "bronze" casting alloy for large or small castings of sound, homogeneous structure, high strength and corrosion resistance. Ajax Metal Co., 52 Richmond St., Philadelphia 23.

T-1: Copper-tin-magnesium-zinc alloy of aluminum developed for heat-treatable sand castings; for engine parts, diesel equipment, etc. National Bronze & Aluminum Foundry Co., Laisy & Thomas Ave., Cleveland.

Toncan Iron: Corrosion-resisting iron with Cu-Mo for roofing and siding, pipes, locomotive boiler tubes. Republic Steel Corp., Republic Bldg., Cleveland.

Ton-Tex: Composition belting. Ton-Tex Corp., 247 Pearl St., N. W. Grand Rapids 2.

Tool-Arc: See Arcaloy.

Tool-Arc: Tool-steel electrodes for welding water hardening, hot work, air hardening, work hardening, oil hardening high-speed tool steels. Alloy Rods Co., York, Pa.

Toolface: Special hard-facing welding electrodes. American Manganese Steel Div., Chicago Heights, Ill.

Toolface: Welding rod. American Brake Shoe Co., 230 Park Ave., New York 17.

Tool-Flex: Flexible tool holder for reaming, tapping, honing, etc. Burg Tool Mfg. Co., 5028 W. Jefferson Blvd., Los Angeles 16.

Toolite: Thermosetting plastic for making dies, drill jigs, fixtures, etc. Impervious to water, oils, cutting compounds; can be machined like hard wood, nonconductor, fireproof. Consolidated Vultee Aircraft Corp., San Diego, Calif., or Adhere, Inc., Los Angeles.

Toolweld: Arc-welding electrode for building up cutting edges on high-speed tool steel. Lincoln Electric Co., 12818 Coit Road, Cleveland 1.

Topal: Alloy with Cu-Mn-Fe-Al; for shafts, bearings, dies, gears. Allgemeines Deutsches Metallwerk, G.m.b.H., Berlin, Germany.

Topal: 80 Cu, 20 Mn-Fe-Al for shafts, bearings, dies, gears. Allgemeines Deutsches Metallwerk, G.m.b.H., Berlin, Germany; International Development Co., 19 Rector St., New York.

Topflight: Identification and laminated pressure-sensitive identification tapes; dimpling tools; broken drill tools; rivet removers; round rivetors. Topflight Tool Co., Huber Bldg., York, Pa.

Tophet: Series of high nickel-chrome alloys with Fe-Mn-Si or Cr-Fe-Si for resistance wires, heating elements. Wilbur B. Driver Co., Newark, N. J.

Tophet: 70 Ni-20 Cr iron alloy for heat and corrosion-resistant parts, conveyor belts. Wilbur B. Driver Co., Newark, N. J.

Torch Tip: Industrial gas burner of the open type with flame retention design. National Gas Burner Div. of Mid-Continental Metal Products Co., 1960 N. Clybourn Ave., Chicago 14.

Torchweld: Welding and cutting torches and tips; machine-cutting torches and tips; portable and stationary acetylene generators. National Cylinder Gas Co., 205 W. Wacker Drive, Chicago 6.

Torit: Self-contained dust collectors for grinding and polishing wheels, etc. Torit Mfg. Co., 292 Walnut St., St. Paul 2.

Tormanc: Manganese steel for nuts and bolts. Samuel Fox & Co., Ltd., Sheffield, England.

Tormol: Steel alloy with Ni-Cr-Mo for gears, shafts. Samuel Fox & Co., Ltd., Sheffield, England.

Totrust Enamel: Synthetic resins in various colors for metal specialties and industrial equipment. Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 16.

Tough Devil: Wear resisting, austenitic welding rod for high Mn steels. Champion Rivet Co., Harvard & E. 108th St., Cleveland.

Toughite: Cr-V iron for tires and rollers in kilns, coolers and dryers. Vulcan Iron Works, Wilkes-Barre, Pa.

Tournarope: Preformed, long-lay wire cable. For cranes, earth-moving machinery, etc. R. G. Le Tourneau, Inc., Peoria, Ill.

Tournaweld: Welding rod. R. G. LeTourneau, Inc., Peoria, Ill.

Towmotor: Lift trucks for materials handling. Towmotor Corp., 1221 E. 152nd St., Cleveland 10.

Trabon: Centralized lubricating systems for grease and oil. Trabon Engineering Corp., 1814 E. 40th St., Cleveland 3.

Tracer-Controlled Hydromatic: Automatic-bed type milling machines for tracer-controlled profile milling operation. Cincinnati Milling Machine Co., Marburg Ave., Cincinnati.

Tractocrane: Caterpillar tractor mounted Link-Belt cranes. Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

Tractor: Buffing fabric. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Tran-Cor: Silicon-iron alloys for electrical purposes, transformers, generators. American Rolling Mill Co., Middletown, Ohio.

Tranelec: Transformer grade electrical steel sheets. Empire Steel Corp., Mansfield, Ohio.

Transfax: Light-sensitive spray coating for reproduction of engineering drawings on metals, plastics or wood. Eastman Kodak Co., Rochester 4, N. Y.

Transfer-Matics: Power-actuated mechanical transfer systems which automatically load, clamp, release and advance work from one machine to the next. Cross Co., Detroit 7.

Transformer: Magnetic core material: lowest core losses consistent with good shearing properties. Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh.

Transite: Pipe, conduit, sheets. Johns-Manville, 24 E. 40th St., New York 16.

Transtacker: High-lift, tiering electric industrial trucks. Automatic Transportation Co., 149 W. 87th St., Chicago 20.

Transweld: Welding rod for mild steel. Lincoln Electric Co., 12818 Coit Rd., Cleveland.

Trantinyl: Cast steel, wear resistant; for rolling mill equipment. Youngstown Alloy Casting Corp., Youngstown, Ohio.

Travel-Cut: Wire and rod straightening and cutting machines. Lewis Machine Co., 3441 E. 76th St., Cleveland 4.

Travograph: Machines for cutting and welding metal by means of gases. Air Reduction Sales Co., 60 E. 42nd St., New York 17.

Traxo: Railway car couplers. National Malleable & Steel Castings Co., Cleveland 6.

Tred-Seal: Liquid waterproofing, crack-filling and splinter-proof covering for wood or concrete floors. Rock-Fred Corp., Inc., 633 W. Washington St., Chicago 6.

Treet-O-Centrol: Flow control devices. Proportioneers, Inc., 87 Codding St., Providence 1.

Trenite: Heat, wear and corrosion-resistant cast iron for heavy duty applications. Trenite Corp., Willow & Miller Sts., Trenton 1, N. J.

Trentweld: Stainless steel or Inconel tubing. Trent Tube Mfg. Co., East Troy, Wis.

Triad: Stabilized trichlorethylene for solvent vapor degreasing of metals between fabricating operations and before painting, plating, etc. Detrex Corp., Detroit 27.

Triad Alkalis and Emulsions: Cleaning compounds for use in metal parts washers and still tanks for cleaning between fabricating operations and before painting, plating, etc. Detrex Corp., Detroit 27.

Triad PR: Wall coating for paint spray booths permitting paint accumulation to be removed by water or steam. Detrex Corp., Detroit 27.

Triangle Mesh: Concrete reinforcement. American Steel & Wire Co., Cleveland 13.

Triclad: Series of integral-horsepower electric motors. Standard and explosion-proof types. General Electric Co., Schenectady, N. Y.

Triclene: Trichlorethylene and perchlorethylene solvents for metal cleaning. E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

Trico: Renewable cartridge fuses and elements; fuse pullers, leak-proof air guns, oilers. Trico Fuse Mfg. Co., 5th and Chambers St., Milwaukee 12.

Trim Bronze: Commercial bronze or red brass, acid dipped and dry rolled to give high quality finish suitable for architectural trim. Chase Brass & Copper Co., Inc., Waterbury 91, Conn.

Trimet: Tungsten wire for sealing into glass. Callite Tungsten Corp., Union City, N. J.

Tri-M-ite: Silicon-carbide abrasive. Clover Mfg. Co., Norwalk, Conn.

Triple A: Aluminum-alloy castings. Acme Aluminum Alloys, Inc., Dayton 3, Ohio.

Triple-A: Industrial enamels in various colors for machinery, equipment, etc. Quigley Co., Inc., 527 Fifth Ave., New York 17.

Triple-A Protective Coatings: Industrial paints for the protection of iron, steel, wood, brick and concrete. Quigley Co., Inc., 527 Fifth Ave., New York 17.

Triple-Clip: Machine for circular cold sawing of sheet metals. Motch & Merryweather Machinery Co., Cleveland 13.

Triplex: Cap and set Screws, bolts, nuts and rivets. Triplex Screw Co., 5309 Grant Ave., Cleveland 5.

Tri-Plex: Geared scroll combination chucks

having patented mechanical device for locking jaws on common center. Cushman Chuck Co., Hartford.

Triplex: Buffs. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Triplex: Rubber lining for steel pickling tanks. B. F. Goodrich Co., Akron, Ohio.

Tri-Ply: A stainless clad steel for heat and corrosion-resistant parts. Universal-Cyclops Steel Corp., Bridgeville, Pa.

Triploc: Plugs, receptacles and electrical connectors. Pyle-National Co., Chicago 51.

Triskalite: White chromium-like electrodeposits on metal articles. Triskalite Corp., 67 Wall St., New York.

Tritex No. 2: Cold-finished steel bar combining good machinability with strength and response to hardening. La Salle Steel Co., P. O. Box 6800-A, Chicago 80.

Triumph: Gasket comprising a soft filler partially or completely enclosed by metal and designed to be easily compressed and to resist high pressures and temperatures. Goetze Gasket & Packing Co., Inc., New Brunswick, N. J.

Triumph Holder: Multiple steel character stamping by a single hammer blow. Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh 13.

Tri-Vac: Tripoli compositions. Bruce Products Corp., 5712 12th St., Detroit 8.

Trodaloy: Copper alloy containing beryllium and chromium; for welding electrodes, switch plates, cams, spring fingers, and mechanical parts requiring high electrical conductivity. American Brass Co., Waterbury 88, Conn.

Trodaloy: Copper-cobalt alloy (2.6 Co) with 0.4 Be, for resistance welding electrodes, springs. General Electric Co., Schenectady.

Trojan Babbitt Metal: Low-melting lead-antimony-tin babbitt for bearings. Hoyt Metal Co., 113 Broadway, New York.

Trojan E. P. Greases: Sturdy grease with high load-carrying ability especially adopted for use on roller necks in steel mills. Cities Service Oil Co., Bartlesville, Okla.

Trojan Lubricants: Greases. Cities Service Oil Co., 70 Pine St., New York 5.

Tropelite: Alkali, acid and moisture-proof Bakelite varnishes in clear, black and gray. Tropical Paint & Oil Co., 1276 W. 70th St., Cleveland.

Troxide: Bright-dipping compound. Safety & Maintenance Co., Inc., 601 W. 26th St., New York 1.

Troxide: Inert chemical which when mixed with water forms combination of sulfuric and muriatic acids for pickling metals and bright dipping. Waverly Petroleum Products Co., Drexel Bldg., Independence Sq., Philadelphia 6.

Troxol: Rust, scale or tarnish removing paste, to be sprayed or painted on steel or iron surface too large to be pickled. Waverly Petroleum Products Co., Drexel Bldg., Independence Sq., Philadelphia 6.

Trualoy Aluminum: Aluminum alloy for light-alloy castings. True Alloys, Inc., 284 S. Summit St., Detroit.

Truarc: Retaining rings. Waldes Kohinoor, Inc., 47-10 Austel Place, Long Island City 1, N. Y.

Trubine: Pulverized resin used as dry binder for foundry core and molding sand. Hercules Powder Co., Inc., Wilmington, Del.

Truck-Man: Industrial lift trucks. Yard-Man, Inc., Jackson, Mich.

Truckmaster: Dial-type motor truck scales. Toledo Scale Co., Toledo.

Trucloader: Gas or electric fork truck, ½ ton capacity, loads highway trucks and for general industrial use. Clark Tructractor, Div. of Clark Equipment Co., Battle Creek, Mich.

• **In order to assure the accuracy and completeness of this directory, manufacturers and suppliers serving the metalworking industry are requested to check the trade names appearing in this and succeeding issues and to advise THE IRON AGE of any omissions or errors. These changes will be incorporated in the first reprint made for general distribution. Communications should be addressed to THE IRON AGE, 100 E. 42nd St., New York 17. Attention Trade Name Directory.**

Tructractor: Fork lift trucks, etc. Clark Equipment Co., Battle Creek, Mich.

True-Wel: Electrically welded steel tubing. Tube Products Ltd., Oldbury, Birmingham, England.

Trufin: Integral finned steel tubing. Wolverine Tube Div., Calumet & Hecla Consolidated Copper Co., 1015 E. 16th St., Los Angeles 21.

Trufin: Integral-finned tube, suitable for nearly all kinds of heat transfer work, heaters, coolers, interchangers, condensers and many other applications. Wolverine Tube Div., 1411 Central Ave., Detroit 9.

Truflex: Series of thermostatic bimetals. General Plate Co., Attleboro, Mass.

Truflo: Fans for cooling industrial personnel. Truflo Fan Co., 552 Main St., Harmony, Pa.

Truforming: Crush-form contour grinders for precision contours. Thompson Grinder Co., Springfield, Ohio.

Tru-Grip: Collet-type tap holder. Procunier Safety Chuck Co., 18 S. Clinton St., Chicago 6.

Trulime: Composition for use in buffing and polishing. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Truscor: Corn flour for foundry molds. Independent Foundry Supply Co., 2325 E. 38th St., Los Angeles 11.

Trutest: Cover for gages. A. Schrader's Son Div., Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 17.

Tru-Test: Sampler collects samples of liquids in proportion to the flow. Chicago Pump Co., 2300 Wolfram St., Chicago 18.

Tru-Trac: Car type mold conveyors. Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

T. S. S. Alloy: Series of Mg-Ti aluminum alloys for furniture, light fixtures, castings. Karl Schmidt Co., Neckarsulm, Germany.

Tube-Alloy: High-strength lead tubing for water gas and oil. American Smelting & Refining Co., 19 Nassau St., New York 5.

Tubeloy: Extruded lead alloy for water service pipe. American Smelting & Refining Co., Perth Amboy, N. J.

Tuck-Away: Cover for hose reels. A. Schrader's Son Div., Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 17.

Tufaloy: Alloy cast iron. Fort Pitt Steel Casting Co., 25th St. & B. & O. R. R., McKeesport, Pa.

Tuf-Flex: Tempered plate glass for use where conditions require unusual durability, principally for frameless glass doors. Libbey-Owens-Ford Glass Co., Toledo 3.

Tuff-Plate: Aluminum pattern plate for foundries. Kindt-Collins Co., 12653 Elmwood Ave., Chicago 11.

Tufnek: Pneumatic tools such as rivet sets and paving breaker steels. Indicates process applied to tool shanks to eliminate breakage. Delaware Tool Steel Corp., Wilmington 99, Del.

Tuf-Stuf: Corrosion-resistant copper alloy with 11-Al and 3 Fe, for pickling equipment, piston rods, gears, pumps, nuts. Mueller Brass Co., 237 Curtis Bldg., Port Huron, Mich.

Tuftex: Air-dry enamels in all colors for metal articles and machinery. Frazer Paint Co., 2475 Hubbard, Detroit.

Tuf-Timber: High-carbon steel for general forgings. Carpenter Steel Co., Inc., Reading, Pa.

Tuftork: Heat-treated high-strength bar steel to guaranteed minimum tensile properties; minimum tensile strength, 125,000 psi. La Salle Steel Co., P. O. Box 6800-A, Chicago 80.

Tuf-Wear: Alloy steel castings. Oklahoma Steel Castings Co., 1200 N. Peoria Ave., Tulsa, Okla.

Tukon: Instrument for measurement of hardness of extremely thin metal, plated surfaces, exceptionally hard and brittle materials, exceptionally shallow carburized or nitrided surfaces, and very small parts. Wilson Mechanical Instrument Co., 383 Concord Ave., New York 54.

Tum-Blast: Blast cleaners. American Foundry Equipment Co., Inc., 451 S. Byrkit, Mishawaka, Ind.

Tumico: All types of micrometers. Tubular Micrometer Co., St. James, Minn.

Tungsten Magnet: Permanent-magnet steel. Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22.

Tungum: Brass with Al-Fe-Ni-Si for compressors, pumps, chemical apparatus. Tungum Alloy Co., Ltd., Brandon House, Gloucestershire, England; Wonham, Inc., 44 Whitehall St., New York.

Tuncro: Tungsten permanent magnet steel. Allegheny-Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22.

Turbadium Bronze: Corrosion and wear-resisting alloys of copper and zinc with Sn-Pb-Al-Mn-Ni for propellers and pistons. Manganese Bronze & Brass Co., Ltd., London, England; Cramp Brass & Iron Foundries, 942 Simpson St., Eddystone, Pa.

Turbo: Copper-aluminum nickel alloy for worms, wheels, pumps, spindles. Allgemeines Deutsches Metallwerke, G.m.b.H., Berlin, Germany; International Development Co., 19 Rector St., New York.

Turbo: White alloy containing 80 Cu and Al-Ni; for worm wheels, pumps, spindles, shafts in acid service. Allgemeines Deutsches Metallwerke, G.m.b.H., Berlin, Germany.

Turbovane: Centrifugal fans. Westinghouse Electric Corp., East Pittsburgh, Pa.

Turco Railroad: Hot tank and chemical spray cleaner. Turco Products Inc., Los Angeles 54.

Turned: Hexagon brass nuts. Fischer Special Mfg. Co., 446 Morgan St., Cincinnati 6.

Tux: See Truscor.

Twin-Disc: Clutches and clutch couplings. Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

Twindow: Panes of glass with hermetically sealed air space between and a protecting frame of stainless steel. Pittsburgh Plate Glass Co., 2376 Grant Bldg., Pittsburgh.

Twin-Hook: Rolled and forged steel frog plate adjustable to fit any tie position under any frog. Bethlehem Steel Co., Bethlehem, Pa.

Twin-O-Matic: Grinding machines. Norton Co., Worcester 6.

Twin Terminal: Rail bonds. American Steel & Wire Co., Cleveland 13.

Twoscore: 2 Ni, 18 Cr stainless steel for spindles, propeller shafts, marine applications. Brown, Bayley's Ltd., Sheffield, England.

204 Marking Machine: Marking of flat or round parts with special lettering, trademarks or designs with special steel dies or interchangeable type. Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh 13.

Tygon: Corrosion-resistant paint applied cold by spray gun or brush. For steel and concrete structures, ventilator hoods, duct systems, underneath machines, containers, etc. Central Scientific Co., Chicago 13.

Tygon: Synthetic rubber-like material having corrosion resistance like that of chemical stoneware (resists hydrochloric acid); for molded corrosion-resistant products, linings for pickling, plating and cleaning tanks; surface protective coatings. United States Stoneware Co., 5302 E. Tallmadge Ave., Akron, Ohio.

Tygon Tempro-Tec: Stable, transparent, non-adhesive organic film which resists oil, grease, gasoline, etc.; can be peeled off as a complete film; for use during handling, shipping, installation, etc., of machine tools, bearing surfaces and metals in many forms. United States Stoneware Co., 5302 E. Tallmadge Ave., Akron, Ohio.

Tylerite: Cast iron for molding machine parts, match plates. W. S. Tyler Co., 3615 Superior St., Cleveland.

Tyl-Lyke: Special drain channel steel roofing and siding. Continental Steel Corp., Box 744, Kokomo, Ind.

Type 5 Nickel Anodes: Cast, carbon containing nickel anode with 5 pct cobalt. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Type X: Hot tank cleaner for steel. Turco Products, Inc., Los Angeles 54.

Tyson: Tapered roller bearings incorporating the exclusive "all rolls" design giving a full complement of rolls around the raceway said to increase life and capacity for any given size. Tyson Bearing Corp., Oberlin Rd., S. W., Massillon, Ohio.

— U —

U-Bar: Semi-metallic stuffing-box packing having a solid babbitt-metal core and woven asbestos channel for minimum friction and maximum resilience. Goetze Gasket & Packing Co., Inc., New Brunswick, N. J.

U.B.K.: Chemically bonded chrome-magnesia brick. E. J. Lavino & Co., 1528 Walnut St., Philadelphia 2.

Ucilon: Corrosion-resistant organic coating material for protecting surfaces against acids, alkalies, water, gasoline, and various corrosive chemicals. United Chromium, Inc., 51 E. 42nd St., New York 17.

Udylite: Semi-automatic electroplating machines, chemicals, cleaning agents. Udylite Corp., 1651 E. Grand Blvd., Detroit 11.

U.H.B. Stainless: Complete series of stainless steels for service in the chemical industry, cutlery, instrument manufacture. Uddeholms, A. B., Uddeholm, Sweden.

U.H.B. Stainless: Series of straight-chrome and Cr-Ni stainless steels for heat and corrosion-resistant parts. Uddeholms, A. B. Uddeholm, Sweden.

U-Loy: Steel sheets for culverts, roofing. Republic Steel Corp., Republic Bldg., Cleveland.

Ultimo: Heavy duty, 2.0 Ni, Mn-Cr-Mo steel for shafts, gears. Canadian Atlas Steels, Ltd., Welland, Ontario, Canada.

Ultra-Cut: Free-machining bessemer steel for screws, bolts, bushings, spindles. Bliss & Laughlin, Inc., Harvey, Ill.

Ultraflex: Plasticizing resins for special lacquers for metal priming. Hercules Powder Co., Wilmington, Del.

Ultra Finish: Finishing process to impart to gage blocks a plane surface. Fonda Gage Co., 59 Daly St., Stamford, Conn.

Ultraloy: Cast 37 Cr, 8 Al iron alloy for furnace parts. Hevi Duty Electric Co., 4152 Hegland Blvd., Milwaukee.

Ultrasene: Used to dissolve red-iron paste for carrying out Magnaflux process to detect cracks, laps, etc., in steel parts. Atlantic Refining Co., 132 So. 22nd St., Philadelphia.

Ultra-Speed: Reversing planer drives. Allis-Chalmers Mfg. Co., Milwaukee 1.

Una: Flux-coated welding rods for high speed. Una Welding Inc., 1615 Collamer St., Cleveland.

Una: Rail bonds. American Steel & Wire Co., Cleveland 13.

Unbrako: Hollow set and socket-head cap screws. Standard Pressed Steel Co., Jenkintown, Pa.

Unefco: Rolls for metal rolling mills. United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh 22.

Unichrome: Alkaline copper-plating process; used as a base for bright-nickel plating. United Chromium, Inc., 53 W. 42 St., New York 17.

Unichrome: Chemical dip solution, room temperature, to apply jet black color on zinc or cadmium in from 1 to 5 min. United Chromium, Inc., 51 E. 42nd St., New York 17.

Unichrome: Various products, including plating processes, dips, strips, rack coatings, stop-off lacquers, and a wide variety of organic coating materials. United Chromium Inc., 51 E. 42nd St., New York 17.

Unichrome Copper: Mildly alkaline, noncyanide copper plating bath which produces smooth, lustrous deposits at high speeds. United Chromium, Inc., 51 E. 42nd St., New York 17.

Unichrome Dips: Compounds used for the immersion treating of zinc and cadmium surfaces to produce black, olive drab, or clear conversion coatings which greatly increase corrosion resistance. United Chromium Inc., 51 E. 42nd St., New York 17.

Unichrome Strips: Compounds for the electrolytic stripping of copper, chromium, and other electrodeposits from steel or cast iron without etching the base metal. United Chromium Inc., 51 E. 42nd St., New York 17.

Unidense: Cast iron rolls. United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh 22.

Unilets: Threaded and no-thread conduit fittings; electrical metallic tubing. Appleton Electric Co., 1701 Wellington Ave., Chicago 13.

Uniloy: Complete series of corrosion and heat resisting stainless steels for acid pumps, bolts, gun parts, hardware and heat resisting purposes. Universal-Cyclops Steel Corp., Bridgeville, Pa.

Unimetal: White metal for welding applications. Unimetal Co., Franklin, Pa.

Union: Bearing babbitt. Glacier Metal Co., Richmond, Va.

Union: Calcium carbide. Linde Air Products Co., 30 E. 42nd St., New York 17.

Unionaloy: High C-Si-Mn abrasion resisting cast iron for mill guides, tube mill plus,

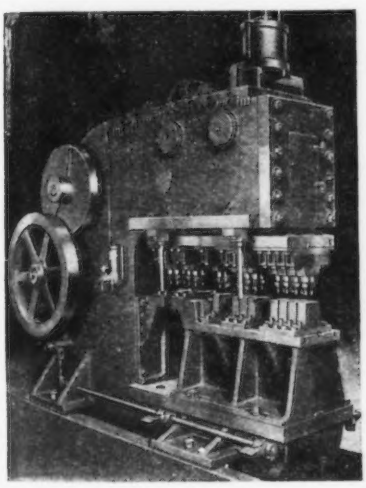
(*Continued on page* 134)

New Equipment . . .

Stamping and Forming Presses

Toggle machines, single action hydraulic and arbor presses, molding machines, hobbing and notching presses and bending and duplicating machines are featured in this week's review. Accessories such as die sets, an overload pitman, utility tables and drawing and forging compounds are also among the new developments described.

1 Size 12 toggle machine, designed to handle a wide range of structural steel shapes and sections for both flange and web punching in one handling, has been announced by *Beatty Machine & Mfg. Co.*, Hammond, Ind. Special tools covering a wide variety of punching requirements can be applied on this machine; die space can be modified if wider ram face is required. Punching tools with double-gag punching and die holders provide two diameters on each



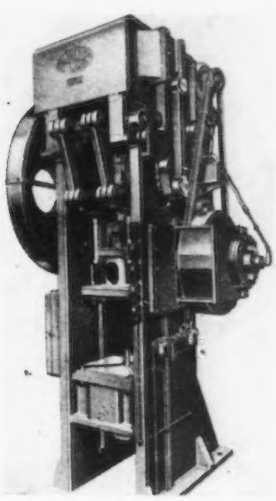
pitch line, saving time and eliminating rehandling, since the two diameter holes can be punched on the same pitch line without the necessity of changing tools. Control levers for duplicate punching are provided. The machine is 137-ton capacity, having a 1¾-in. stroke and 25-in. throat.

500-Ton Forming Press

2 Featuring an oversize die cushion, a selfcontained, 500-ton forming press has been introduced by *Watson-Stillman Co.*, Roselle, N. J. The new cushion size adapts the press to larger and more varied loads than those previously allowable. Surface dimensions of the cushion are 3 ft 4 in. x 3 ft 4 in. Maximum tonnage is 175. Stroke is 18 in. and diameter is 14 in. Working pressure of the press is 2000 psi, which is controlled by a single knob. Press control is accomplished by a single lever on manual operation. A pushbutton handles single-cycle automatic operation. Reversal is pressure-controlled. The press advances and returns at a speed of 300 ipm. Speeds in compression are 30 ipm for pressures up to 250 tons and 8 ipm above 250 tons.

Toggle Presses

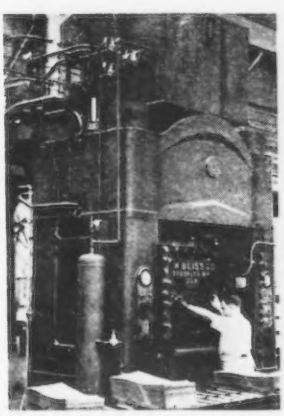
3 A line of single-crank toggle presses in eight sizes ranging from 4¼ to 7 in. shaft diam and from 8½ to 24½ in. stroke length has been announced by *E. W. Bliss Co.*, 450 Amsterdam St., Detroit. They are used for deep drawing operations on steel, brass, copper, aluminum and other metals. Designs feature steel weldment construction, resulting in weight-savings



and reduced floor space requirements. Operating speeds, stroke lengths and die-space dimensions remain the same as those for previous models, thereby permitting interchange of tools. Redesign of the toggle driving mechanism provides a cross head with long guides at the position where it is most needed. Steel rockshafts, yokes and links are provided in the toggle-driven blankholder mechanism. The clutch is of the single-disk friction type, with one-station electric pushbutton control. Single drive crankshaft and single end blankholder drive are employed. Radially T-slotted bolster plates and direct-connected adjustable bottom lift outs are standard equipment.

Single Action Press

4 A 1500-ton capacity press has been added to the line of single action hydraulic presses manufac-

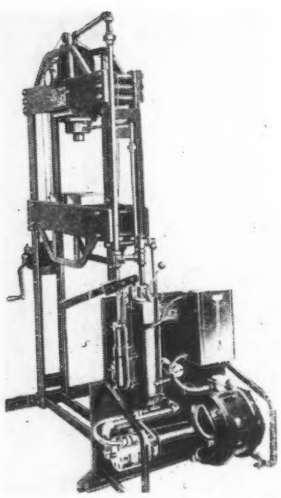


tured by *E. W. Bliss Co.* 450 Amsterdam St., Detroit. This housing type press illustrated can be used to produce blanked, stamped, formed, pierced, trimmed, drawn and embossed parts from sheet metal. The press is equipped with a 12 in. ram stroke and a hydraulic drawing cushion stroke of 6 in. It features rugged frame with fully shrunk tie-rods and keyed housings; positive drive of closing stroke; universal electric control, providing for speed change and reversal; safety control, for instant

stopping at any point; convenient pressure adjustment; and delayed action of the cushion return, allowing slide to raise from work before the finished piece is stripped from the die. Reversal is effected automatically by either predetermined pressure or position of the slide. Quick advance speed is 750 ipm and pressing speed, 17 ipm.

Hydraulic Arbor Presses

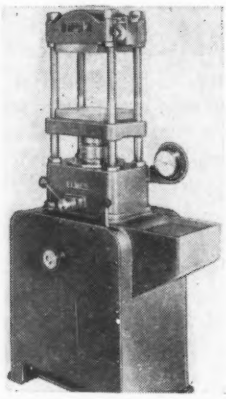
5 Motor-driven hydraulic arbor presses of 25, 50, 60 and 75-ton capacities have been designed by *K. R. Wilson*, 10 Lock St., Buffalo, N. Y., to provide industry with units for short runs or small work. The frame of the presses is made of hot-rolled steel; bed plates are trussed for added strength with all joints electrically welded. The bed is raised or lowered by means of a cable drum and crank. Since the frame is a weldment, most press dimensions may be changed to meet



any particular problem. Operation of the ram is controlled by a conveniently located motor valve control which is actuated by a flip of finger and thumb. The hydraulic pump is a Seco radial type ranging in capacities from 3000 to 10,000 psi. All units are equipped with the KRW pressure by-pass valve, permitting required tonnage pressure to be accurately set and then maintained in successive operations. Another feature is the spring actuated, quick return ram which returns the ram to the open position instantly, when the control lever is released.

Air-Hydraulic Presses

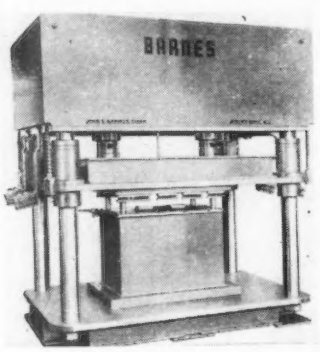
6 A line of fully power-operated, hydraulic presses that have neither motor nor pump has been announced by *Elmes Engineering Works, American Steel Foundries*, 1002 Fulton St., Chicago 7. Compressed air from shop line, introduced above the liquid by a simpli-



fied control, provides the power for rapid closure and instantaneous full pressure; applies and maintains any desired pressure within capacity range; and repeats at that pressure until reset. Economies in the molding of plastics and rubber, in assembly forcing, straightening and testing are claimed for this hydraulic principle. Presses are simple in design, lightweight and compact. They are made in 20 and 30-ton bench-type and floor type models and in 50-ton floor type. The 30-ton floor-type, illustrated, has a 6-in. stroke opening adjustable from 0 to 13 in. and can be equipped with 10 x 10 in. hot plates.

Hydraulic Press

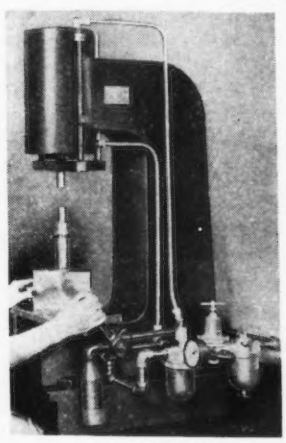
7 Advance in the high speed handling of sheet metal fabrication is claimed for two new hydraulic presses of 25-ton and 50-ton capacities added by the *John S. Barnes Corp.*, 142 Walnut St., Rockford, Ill., to its line of hydraulic



metalworking equipment. Designed for the piercing, punching, forming, and drawing of sheet metal parts, these presses are said to combine functions of several presses into one compact machine, thereby reducing production costs. The complete operation is performed with less handling, it is said, and one or two men can perform work formerly requiring several operators. Rejects are reduced, due to greater accuracy of operating methods and down time of machine is cut because of extreme flexibility of adjustment. Each press is powered by a Barnes selfcontained hydraulic unit which insures smooth press operation, constantly under fingertip control. Dual electrical controls increase safety and flexibility of operation.

Air-Powered Arbor Press

8 Suited for light push or pull broaching jobs as well as for fast assembling, stamping, forming, riveting, punching, cutting and other punch press operations, two



air-powered all steel welded construction arbor presses, the Hurricane Six and Eight, have been announced by *Studebaker Machine Co.*, 1221 S. 9th Ave., Maywood, Ill. Double acting air cylinders are used on both models. The Hurricane Six develops 1-ton ram pressure on the down stroke at 80 lb air line pressure and 1 ton on the up stroke. At 120 lb air line pressure the Six develops 1½ tons ram pressure on both the down and up strokes. The Hurricane Eight develops 2 tons ram pressure on the down and up strokes at 80 lb air line pressure and 3 tons at 120 lb air line pressure. These presses give up to 200 sharp punch press ram blows per min; however, the ram can be regulated to a slow squeezing action if desired, with pressure preset from a few pounds to the maximum, and the stroke can be regulated from a few thousandths to 6 in. Presses

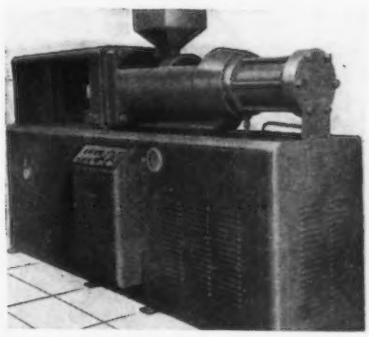
can be connected to present air line; no special installation is needed. Hand lever, foot pedal or push-button control are available. Clear space from platen to ram when fully retracted is 11½ in. and throat depth is from 8 to 9¼ in.

Air-Hydraulic Press

9 Addition of a 6-ton capacity model air-hydraulic press has been made by *Air-Hydraulics, Inc.*, 401 Broadway, New York 13, to its line of 2½-ton capacity models. These presses are used for assembly, riveting, embossing, staking, sizing, crimping, flanging, etc., on metals, plastics and leathers. Offered in both bench and floor models, they may be plugged into the present airline. The 2½-ton model works on a 50:1 ratio on the air intake pressure; the 6-ton model on a 120:1 ratio. Ram pressure is adjustable and is controlled to predetermined specifications from delicate pressures up to 12,000 lb. The same pressure is delivered throughout the entire length of the stroke, it is said, with ram speed adjustable from the slowest action to 300 ipm; the stroke adjustable from 1/16 to 5 in. Presses can be furnished for a predetermined ram dwell or for single cycle or autoamtic action. Foot, hand or solenoid pushbutton control valves are used.

Plastics Molding Machine

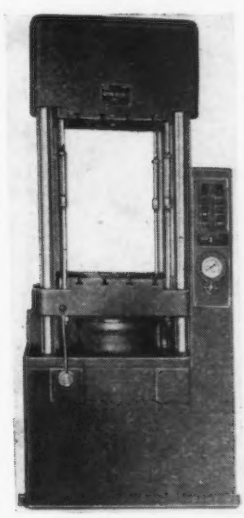
10 A 2-oz plastics molding machine which can be operated successfully, it is reported, by people with little or no experience in the plastics field has been produced by *Hydraulic Machinery, Inc.*, Dearborn, Mich. Two electronic controls regulate the heat in the chamber and nozzle indefinitely without danger of burning the material. A new type electronic control mounted on the machine panel guarantees accuracy of ± 2°F. The control is so mounted that it is not affected by machine vibration. Insight and understanding of plastics molding problems have been used in the engineering of mold clamping, platens, the metering of material, timing and the providing of ample safety precautions. Although this machine is rated at 2 oz, it has actually been designed and built with a 50 pct overload capacity, so that



it is capable of handling a wide range of small plastics parts and products.

Compression Molding Press

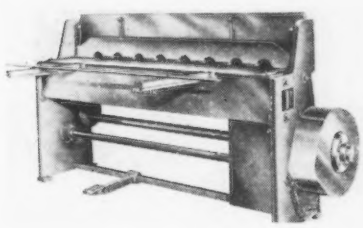
11 A semiautomatic 200-ton capacity compression molding press, offered by *Watson Stillman Co.*, Roselle, N.J., has been designed to provide maximum accessibility to all working parts and to lend itself to high-speed operation without excessive molding heat from



the press frame. The press is of four-column construction, with all vital controls convenient, and all internal and external equipment fitted for smooth, noiseless, minimum-maintenance operation. All internal pressure seals are made with metal piston rings; external packings are of the V type. Moving platens have integral, barrel type guides for the columns. The press has a 15-in. stroke; advance speed is 52 ipm, pressing speed, 12.5 ipm and return speed is 100 ipm. The motor is 7½ hp.

Power Squaring Shears

12 All-steel power squaring shears for all types of shearing and trimming up to 14 gage capacities have been introduced by *Parker Mfg. Co.*, 2200 Colorado Ave., Santa Monica, Calif. Built from extra steel plate of box type design, welded and normalized to relieve stresses, Parker shears are said to possess maximum strength with minimum deflection. Standing only 47 in. high, the shears have a low center of gravity for smooth, vibrationless operation, it is reported. Cutting length is 73 in., blade



length, 75 in. with a back gage range of 18 in. and front gage range of 38 in. The shear is rated at 85 strokes per min. A 2-hp motor is furnished with each shear.

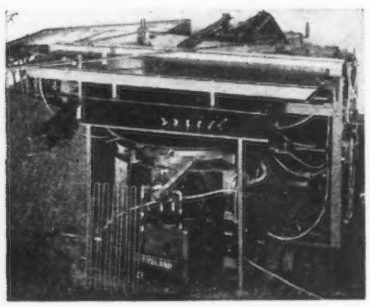
Hobbing Press

13 For precision hobbing and die-sinking, *Watson Stillman Co.*, Roselle, N. J., has announced a 500-ton hydraulic hobbing press suitable for extra-duty, full capacity loads on a small area, due to extra heavy platens. Smooth-bored cylinders are constructed of open-hearth steel, colums are steel forgings and rams are of closegrained iron castings, both columns and rams being ground and polished. Presses can be supplied with hand or motor-driven pumps, the latter being of the Vertical Triplex, the horizontal, or Stedi-flow type.

Bending Machine

14 A machine which takes straight tubes and wraps them into serpentine coils automatically has been announced by *Pedrick Tool & Machine Co.*, 3638 N. Lawrence St., Philadelphia 40. The machine illustrated is capable of bending ten ¼-in. steel tubes at one time. The tubes may be 30 ft or more in

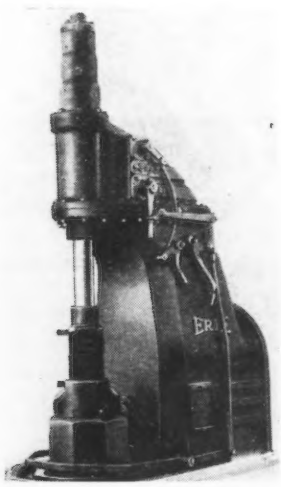
length. The entire operation is automatic except for loading the machine. Tolerances on the bends are kept close, with parallel runs held to a tolerance of ± 0.01 in. and the overall distance from the crown of one end of the coil to the crown on the other end being held to a tolerance of + 0—1/32 in. The flatten-



ing effect is held to 0.020 in. The machine produces four coils per min each of which has 12 bends, averaging 2880 bends per hr. The machine is also suitable for handling copper tubes and will take the tubing off of a roll, straighten it, feed it and bend it into a coil in one operation, it is reported.

Forging Hammers

15 A line of selfcontained pneumatic forging hammers which has been introduced by the *Erie*



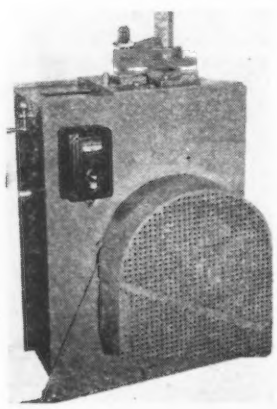
Foundry Co., Erie, Pa., eliminates the need for separate steam or air supplies. The hammers are built in sizes ranging from 200 to 3000 lb falling weight, and are especially adaptable to manufacturers for flat die forging work.

Forging Compound

16 Known as Leadolene, a forging compound, produced by the *Brooks Oil Co.*, 315 Carson St., Pittsburgh 19, for use with ferrous and nonferrous metals, is said to minimize stickers and eliminate build-up on dies. This product deposits on the die an indestructible film of micro thickness which virtually eliminates stickers. Compounded without the use of graphite, it will not build-up on dies. The heavy flash and dense smoke, characteristic of many forging compounds, is reduced to a minimum. The compound is especially adapted to deep die forging and has proved successful in forging railroad car wheels. It is claimed, Leadolene is pharmaceutically pure, thus eliminating the possibility of poisoning anyone coming in contact with it.

Notching Press

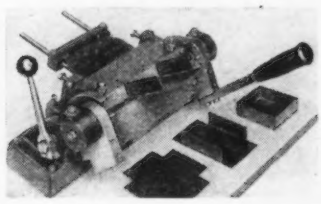
17 Capable of delivering 300 to 600 strokes a minute, a notching press has been developed by the *Edward Hallender Tool Co.*, 390



Belleville Ave., Bloomfield, N. J. The machine was developed specifically for cutting notches in electric motor laminations, and is said to be capable of handling silicon steel up to 1/16 in. thick. Indexing is automatic, and any desired number of notches may be cut. Extreme simplicity characterizes the machine, which is driven by a built-in electric motor. Speed changes are effected by changing the main drive pinion, which is said to be an easy operation.

Duplicating Machines

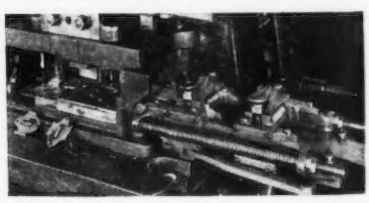
18 Redesigned models of Di-Acro die-less duplicating machines have been announced by *O'Neil-Irwin Mfg. Co.*, 302 8th Ave., Lake City, Minn. Among 10 new features are a reversible double-edge forming blade with both a wide and narrow working surface which allows forming of extremely close reverse bands, new style precision angle degree stops, Rok-Lok, the sensitive material clamping action said to provide greater accuracy and sharper bends, and provision for simple and rapid mounting of special forming blades for unusual duplicating operations. Brakes are offered in



four sizes: 6, 12, 18 and 24 in. All models have a material capacity of 16 gage cold-rolled sheet steel. The Di-Acro radius brake having all the features of the standard model brake is also designed so that it can be adjusted for forming chrome molybdenum and other low ductile alloys.

Die Feeds

19 Two punch press feeds, providing for coverage of the wide range of stock sizes and feed lengths encountered in the metal stamping industry, have been announced by *H. E. Dickerman Mfg. Co.*, 321 Albany St., Springfield, Mass. Known as 6-in. Dickerman die feeds, they are available in two sizes, one feeding coiled strip in any practical combination of thickness up to 3/16 in. and width up to 4 in., the other feeding coiled

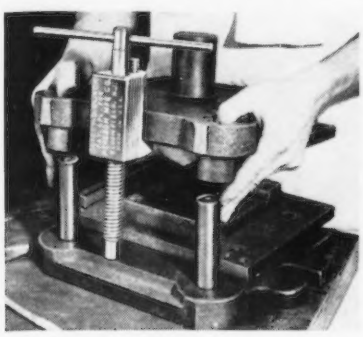


strip in any practical combination of thicknesses up to 3/16 in. and width up to 6 in. Maximum feed length for both of these feeds is 6 in. on presses having a stroke of 3 in. or more, and approximately double the stroke on others. Feed lengths are adjustable from 0 to 6 in. in increments of 0.001 in. These die feeds can be installed quickly and easily, it is reported, on almost any type of punch press, and can

be placed on the die set or bolster plate in any position for any style die.

Die Jacks

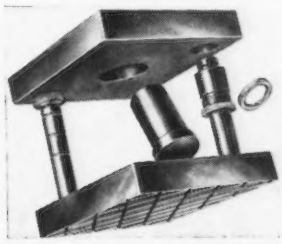
20 Safety die jacks have been designed by *Persson Mfg. Co.*, 2 Henry St., Bloomfield, N. J., to separate die sets easier and faster than by lifting by hand or prying with bars. Applied to the punch holder in a matter of seconds, they are said to enable a single operator to elevate and lower the punch holder surely and positively to any height required. The tools are pre-



cision built throughout for easy screw action, the clamp block being one piece, heat treated aluminum alloy and the other parts made of steel.

Die Set

21 Made with new type guide post bushings, a die set has been announced by *A. W. Grunow Co.*, 563 White St., Orange, N. J. These guide post bushings of phosphor-bronze are tapered and made to turn and contract or expand as desired by loosening a lock ring and turning the adjustment ring accordingly. The punch holder always slides up or down and stays put on the guide posts with a touch of the hand, it is said. In fitting the



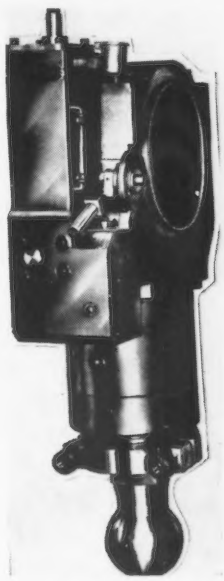
original position of the die into the set and for final fitting and tryout the bushings may be adjusted to any degree of tightness desired. Worn bushings may be replaced in a few minutes at a very low cost, it is reported. This die set offers such advantages as these: Speeds up fitting of the original position of the die into the set; provides positive post alignment at all times because the punch holder and die shoe are bored together; and permits less die clearance, hence, closer tolerances. All die master die sets are made to order in any size.

Drawing Compound

22 A drawing compound has been announced by the *Texaco Co.*, 135 East 42nd St., New York. Called Texaco drawing compound No 2, the product is adapted for use in stamping and drawing operations. It has a paste-like consistency, and is easily washed from a completed piece with water.

Overload Pitman

23 Announcement of a Model HP safety overload connecting link which may be applied to all punch presses by replacing the present conventional pitman, or connecting rod, and ram adjusting screw has been made by *Dayton Rogers Mfg. Co.*, 2835 12th Ave. S., Minneapolis 7. This hydraulic overload connecting strap is arranged to give the necessary tonnage protection within the maximum tonnage capacity of the punch press, not only protect-



ing the crank and press frame, it is said, but also the tools used in the press. It will also compensate for stock thickness variation, or the inserting of two blanks on a forming die on all operations, such as forming, pressing, riveting, briqueting, assembling, etc., because a constant ram pressure is assured at the point of operation at all times. It is now being built in various sizes for press capacities from 37 to 250 tons.

TIME-SAVER CARD for your convenience in obtaining, without obligation, more information on any one or more of the new equipment items featured on this and preceding pages.

2/27/47

THE IRON AGE, New York 17, N. Y.

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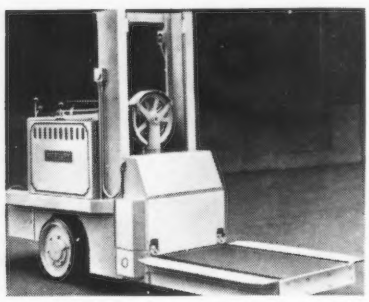
Die Handler Assembly

24 A die handler assembly has been built into a Mogul 5-ton high lift chassis by the *Mercury Mfg. Co.*, 4125 S. Halsted St., Chicago 9. It can also be furnished on Mercury's 3-ton chassis, in either



high or low lift models. The design consists of two power driven die movers, operating in machined slots at the sides of the load platform. Each die mover is driven by a dc motor through a Brad-Foote Gyro speed reducer and roller chains. Independent control is effected by two pushbutton operated magnetic contactors. Pushbuttons are located on the dash. Additional controls at the rear of the load platform may be had if desired. This assembly is said to make it possible for the operator to quickly and easily push the die from the load platform onto the press or storage rack or vice-versa. Die movers may be retracted into slots at the rear of the platform for skid handling.

Silicone Lubricants

25 Two silicones, DC mold release fluid and DC 7 compound used to secure release of rubber or plastic materials fabricated by injection or compression molding, pressure laminating and casting, have been produced by *Dow Corning Corp.*, Midland, Mich. These mold release agents are said to serve as lubricants which reduce the friction between dies and plastic materials, improve plastic flow, reduce surface striation, and afford easy release from the mold or from rubber bags used in low pressure laminating. Because of their largely inorganic nature, they are incompatible with almost all types of organic plastics and rubbers.

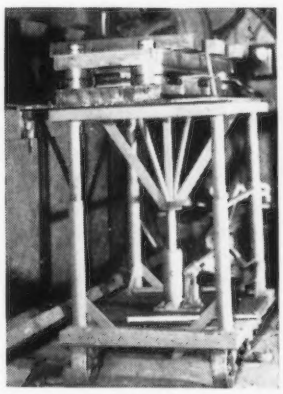
Die Table

26 Offering the advantages of a bench, truck and lifter in a single unit, a combination die table and shop lifter has been manufactured by *Siewek Tool Div., Domes-*

tic Industries, Inc., 231 S. LaSalle St., Chicago. Named the Liftable, this unit is light, fast and heavily built, handling loads up to 2000 lb. Total lift is 14 in.; height of table top lowered is 28 in.; in raised position, 42 in. Size of table top is 26 x 43 in. Construction is all steei, electric-welded.

Utility Table

27 Rated at 2000 lb capacity, a hydraulic utility table for handling die sets has been manufactured by *Rack Engineering Co.*, 5102 Butler St., Pittsburgh 1. A floor pedal raises the load to the exact level required for easy transference to the press bed against



which the table has been placed. The table is mounted on heavy duty roller bearing casters of 6-in. diam permitting easy maneuvering when carrying a capacity load. A heavy duty foot-operated floor lock anchors the table in split-second time.

Metal Punching Calculator

28 Designed to aid in solving forming and punching problems for the sheet metal industry, a bending and punching calculator has been made available by *Verson Allsteel Press Co.*, 1355 E. 93rd St., Chicago 19. By turn of a wheel, the device gives the die opening and press capacity required for making 90° bends in mild steel and stainless steel of all commonly used gages. For punching operations, the calculator indicates the tons per hole required to punch holes of 8 different sizes in mild steel plate.

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2/27/47

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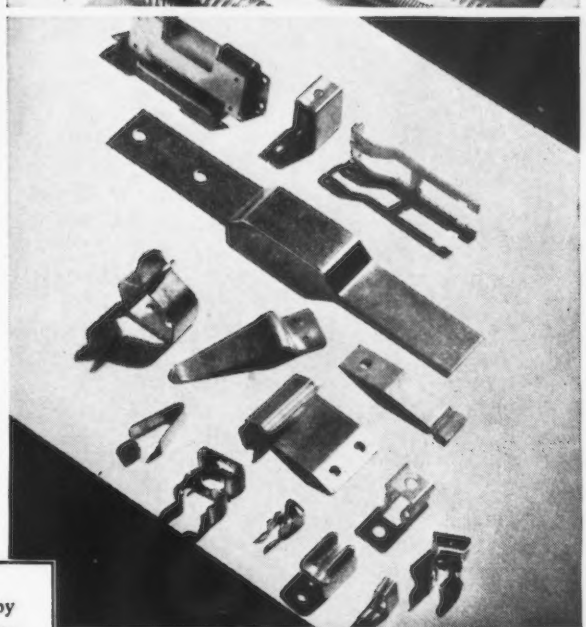

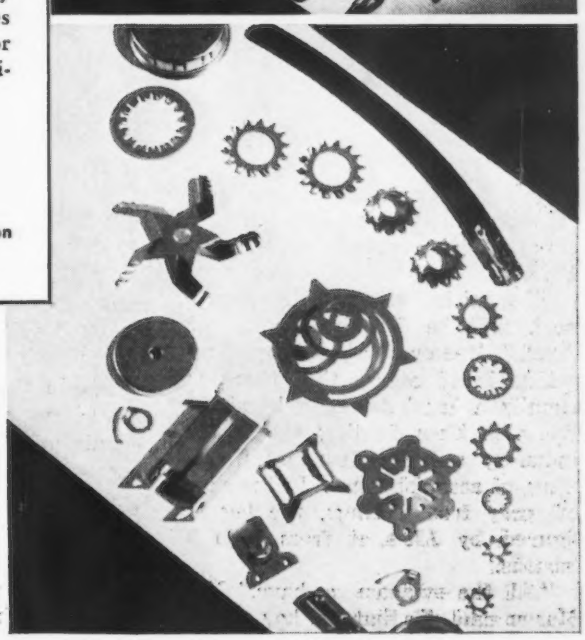

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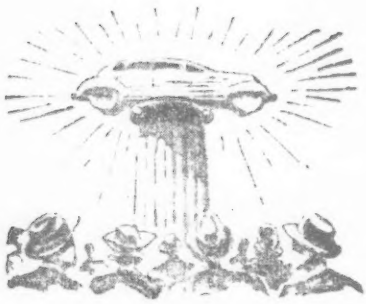
Assembly Line . . .

WALTER G. PATTON

• Automobile industry faces a shortage of pig iron that may result in production cutbacks . . . Number of motorists driving cars to work is falling sharply.



DETROIT—As many observers in the automobile industry see it, the pig iron supply situation was never blacker so far as the automobile industry is concerned.

For many months, foundry suppliers of automotive castings have been living on a hand-to-mouth, beg, buy or barter basis. Backfeeding of pig iron by auto producers themselves to their foundry suppliers has been no small factor in keeping some foundries going that would otherwise have had to halt operations months ago because of the pig iron shortage.

This week the pig iron problem got front page attention when George W. Mason, president of the Automobile Manufacturers Assn., announced cryptically that a shortage of pig iron threatens to force cutbacks in the motor industry through the second quarter of 1947.

The initial effects, Mr. Mason said, will be felt in "March or April." Reason for the delayed reaction is of course that there is usually a lag between a break in the pipe lines feeding the motor industry and the resulting throttling of assembly lines. In the case of gray iron castings, the lag is figured by AMA at from 1 to 2 months.

"All the evidence we have," Mr. Mason said, "is that the key to the pig iron shortage is the allocations to housing purposes, which seem to exceed present realistic housing completion schedules. We are fully aware of other conditions limiting pig iron supply, and it is because of these that we maintain it is absolutely necessary to avoid tying up valuable tonnage where it will not be put to immediate use."

Mr. Mason prescribed the usual treatment for shortages—scrapping of government controls.

To document the AMA case, Mason showed that Midwest Foundry Co. of Coldwater, Mich., has recently advised Borg-Warner Gear Div. that it can no longer fill its contract for auto castings since it will be forced to close for an indefinite period because Republic Steel Corp., its sole source of pig iron, can supply no pig in February and probably none in March.

Republic, in turn, has explained that OPA has taken 87 pct of its Buffalo pig iron for February shipment to stove and cast iron pipe industries.

THERE can be scarcely any doubt that diversions of pig iron to the veteran's housing program have been indeed a serious blow to foundries serving the automotive industry. A survey of Detroit foundries, for example, indicates that as a group these foundries are currently receiving about one-third of their usual allotment of pig iron from regular sources. Vendors have explained the situation on the grounds that diversions of pig iron to the government brakeshoe and housing program in 1946 took 37.5 pct of available pig and the projected housing program for 1947 will jump this figure to 45 pct.

While the impacts of the housing and railroad programs have undoubtedly been major factors in precipitating the present pig iron crisis in the auto industry, there have been many other contributing conditions. For example, the current use of pig iron by steel mills operating near capacity is known to be high because scrap is not only short but higher in price than pig. Again the coal strike last December although brief, was a significant factor. Some observers also point to the fact that certain operators, anticipating a prolonged coal strike, attempted to take advantage of the mine shutdown to rebuild blast furnaces. Some of these units it is reported are not yet back in operation.

What irks the automobile industry most perhaps is to learn that soil pipe producers are supposed to have used on an average 85 pct pig iron in the charge for the 1946 production whereas, many foundrymen maintain that good soil pipe can be made using much lower percentages of pig iron. In contrast to soil pipe producers, the automotive castings producers must of course stay within well defined limits of pig in the charge, being restricted insofar as ability to substitute scrap for pig iron is concerned.

While the pig iron problem is undoubtedly serious at the moment, the fact that this situation has been chronic if not serious for many months without closing too many foundries should temper the calamity howlers in making snap judgments about the present situation. Without attempting to minimize the seriousness of the present shortage, some sources here have pointed out that the auto industry has weathered many material shortages of equal gravity without making serious cutbacks and should be able to do so again in this case.

In his report to the automobile dealers of the country now convening in Atlantic City, George Romney, managing director of the Automobile Manufacturers Assn., makes the prediction that the auto industry will continue to be on a hand-to-mouth basis in 1947 with sheet and strip steel the most critical items, followed closely by copper and pig iron. For the doubtful distinction of dark-horse in the 1948 shortage sweepstakes, Mr. Romney cites soda-ash which is used in glass production.

Commenting on the sheet steel situation, he predicted that barring strikes and other interruptions to production 17 million tons of flat-rolled steel products will be produced in 1947 compared with a 16 million ton output in 1946. A delaying factor, he explained, in

Meet your new POWER lawn mower in the KELLERING stage

Finished, except for final polishing, is the "female" half of a mold for an aluminum power lawn mower housing, ready for removal from the Keller. The scene is the shop of The Sterling Engineering Co., Winsted, Conn.

The "male" half of the lawn mower housing mold in production. Note the wood and plaster "master" at the top with the tracer feeling out the design and the tool below duplicating every detail in metal.

Let the green grass grow — who cares? Your new power lawn mower is on the way. You see it taking form in these pictures as Keller Machines cut the male and female cavities of a large mold for the aluminum lawn mower housing.

Tracer-controlled milling or "Kellering" is the accepted modern method of creating dies and molds. The sensitive electrically controlled tracer feels out the most complicated details in the easily-made wood or plaster "master" and the following cutter duplicates them in tough steel. Fast, faithful and finished is the work of Keller Machines, whether they're big ones making car body dies or little ones making small dies, or parts for pilot models.

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bringing sheet steel output up to the industry expectations has been the prolonged strikes which General Electric, Westinghouse and Allis-Chalmers faced during the past year.

In obtaining sheet steel, Mr. Romney pointed out, auto manufacturers will have to compete as usual with other steel users as well as allocations to the government housing programs, not to mention a recent increase in the railroad car building program from 3500 to 9000 cars per month.

MR. ROMNEY also told the assembled dealers that, (in contrast to opinions widely held in the steel industry) the auto industry hasn't been getting its historical percentage of sheet and strip steel. According to AMA, the motor industry consumed nearly 40 pct of the flat-rolled steel output prior to the war. In 1940, Mr. Romney said, the figure was 37.5 pct. During the first 7 months of 1946 according to AMA sources, vehicle manufacturers received only about 25 pct of the industry total although in September the percentage moved to 30.5.

Another aspect of automobile production directly related to steel is the manufacture of replacement parts. At Atlantic City, Mr. Romney disclosed that a survey of eight passenger car companies showed that in half of these companies the sale of parts continues to climb while the other four have indicated that parts volume is being stabilized at peak levels.

Based on the results of his survey, Mr. Romney feels that parts production volume in 1947 will equal, if it does not exceed the 1946 total. Since the 1946 output was double the prewar year 1941 and 30 pct above any previous year it may be assumed that the demand for steel for automobile replacement parts will continue to be at very high levels and as such will contribute a strongly limiting factor on the output of cars during 1947.

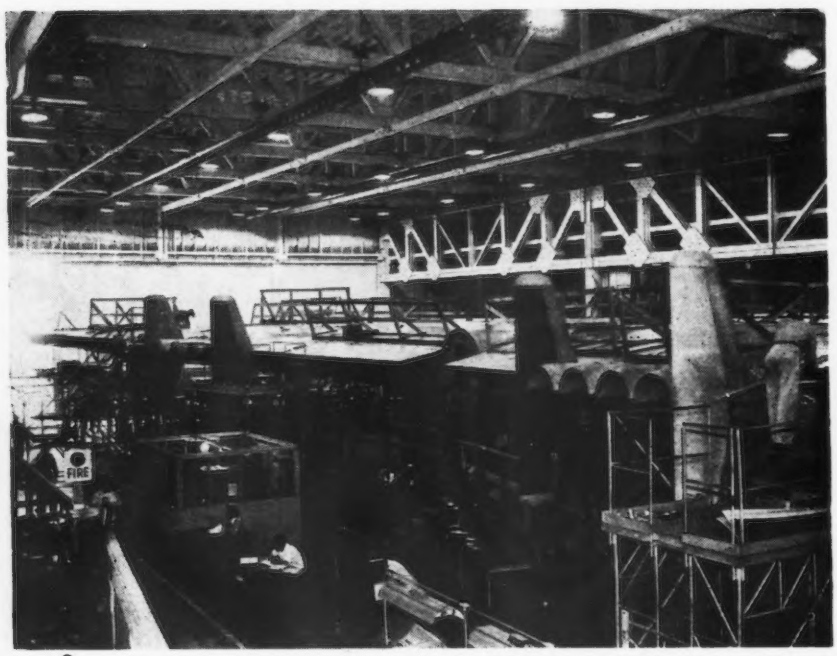
Incidentally, production estimates by steel and automobile executives, Mr. Romney disclosed, ranged from 3,600,000 to 5,250,000 cars and trucks in 1947. Significantly, he added, "only figures from steel sources were below 4 million."

Mr. Romney's own prediction is that 4,700,000 American vehicles will be built in 1947.

Looking critically at the long-term market for automobiles in this country, Mr. Romney pointed out that the current high prices of automobiles, mounting repair bills, greatly increased insurance costs and soaring parking rates are not the only factors that may tend to limit the future market for automobiles. Speaking of city traffic congestion, he pointed out that the number of people comprising the downtown daytime population of Pittsburgh had decreased by 49,000 between 1927 and 1942. Similar losses are reported in St. Paul where 41,789 persons entered the downtown district by automobile on a typical day in 1937. The figure dropped to 22,984 by 1946, Mr. Romney said. A similar trend was evident in Minneapolis; typical figures are 64,625 for a typical day in 1937 and only 37,233 in 1946.

In Washington, D. C. a survey disclosed that while 26 pct of those entering the downtown area before the war traveled by automobile, the figure had fallen off to 15 pct in 1946. The loss was contributed to traffic congestion and inadequate parking facilities.

BIG SWOOSH: *The Army's newest big jet plane, the Northrop Flying Wing YB-49, an eight-jet version of the B-35. The vertical fins on either side of the jet housings are "air separators" which add to the directional stability of the 172-ft bomber. The cylindrical section between the two jet clusters is the aft end of the crew nacelle, which will be capped by a streamlined cone.*



January Studebaker Record Best since '28

Pittsburgh

• • • **More passenger** cars and trucks rolled off the Studebaker Corp., assembly lines during January than during any month since 1928, according to Paul G. Hoffman, president. Mr. Hoffman was in Pittsburgh recently to lead a discussion section of the National Study Conference on Church and Economic Life. While declining to give exact production figures for January, Mr. Hoffman stated January was the biggest production month since 1928 and the company's production is still only at a rate of 50 pct of the schedule set by the company.

The major bottleneck in the company's production program now is steel, according to Mr. Hoffman. He pointed out that the company had the unique record of never having a strike in its 95 years of existence. This, he said, is because the organization is a closely-knit one, with top management being able to deal directly with problems as they arise. Being able to meet with union leaders on an informal basis has lead to a spirit of cooperation that has worked out all problems that could result in strikes.

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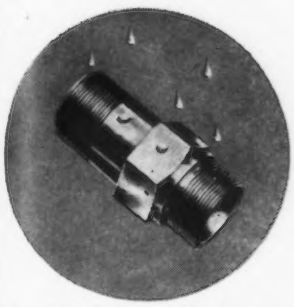
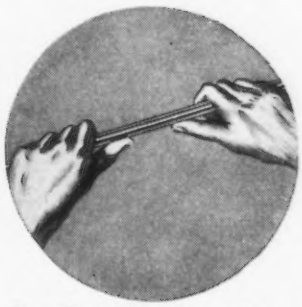
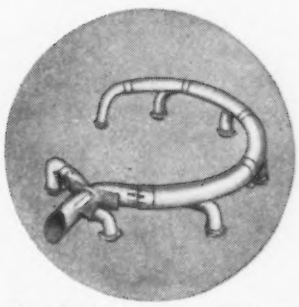


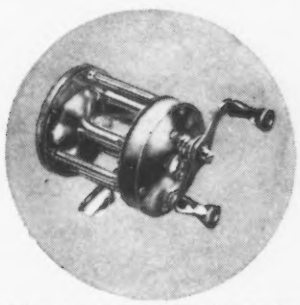
Corrosion Resistance that gives your products more durability, greater dependability, is one of the things you get with Carpenter Stainless.



Strength and Rigidity is an important design consideration in hundreds of light weight products made from Carpenter Stainless.



Heat Resistance for continuous or intermittent service is another important advantage that Carpenter Stainless gives you.



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On jobs where Stainless is used to improve product performance or to give you new sales features, there are good reasons why your first choice should be Carpenter Stainless. Each lot will behave perfectly in your machines, help you cut production costs and eliminate rejects. And just as important, you can get this Stainless right from the nearest warehouse stock listed below. Call today.

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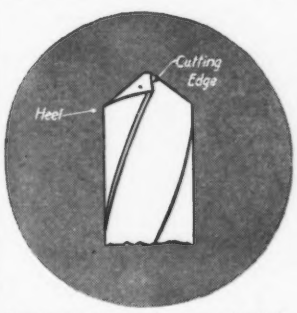
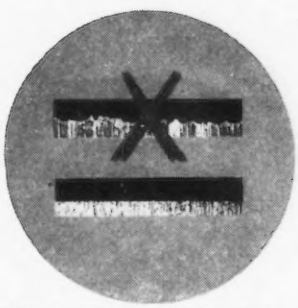


How to double-check your tool grinding on each job.



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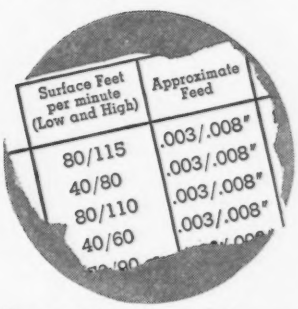
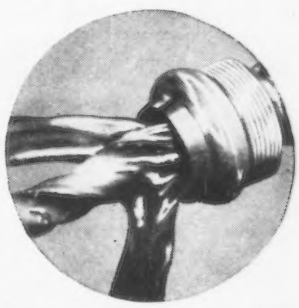


Surface Feet per minute (Low and High)	Approximate Feed
80/115	.003/.008"
40/80	.003/.008"
80/110	.003/.008"
40/60	.003/.008"

How correct speeds and feeds save time and money on every job.



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Washington . . .

L. W. MOFFETT

• Congress expected to extend Army-Navy war power to negotiate contracts for research and technical improvement . . . Savings in buying are seen.

WASHINGTON — Early enactment of legislation extending Army and Navy wartime authority to negotiate contracts for research and development purposes and all types of technical procurement is expected by the War and Navy Depts.

The legislation has been favorably reported by a subcommittee of the House Armed Services Committee and speedy approval is expected from the full committee. In the Senate the bill has the backing of Sen. Chan Gurney, (R-S. D.), Chairman of the Armed Services Committee.

The legislation has three primary objectives: (1) To permit suspension of advertising as a method of procurement immediately upon the declaration of a national emergency; (2) to modernize peacetime military procurement methods; and (3) to unify the procurement legislation under which the Army and Navy do their buying.

Advertising and competitive bidding will be retained for the purchase of standard stock and subsistence supplies.

Congress favors the bill for a variety of reasons. There is, of course, a realization that contracts involving secret developments could not be let on a competitive bid basis. Since the wartime authority for such contracts expires with the end of the national emergency, fairly quick action was deemed necessary. Then, too, economy-minded legislators see an opportunity for savings in unification of Army and Navy procurement practices.

The detailed provisions of the bill now before Congress are essentially the same as that reported in THE IRON AGE, Feb. 14, 1946, p. 120.

However, the Maritime Commission and Treasury Procurement Div. (now the Bureau of Federal Supply) are no longer active cosponsors of the measure. Last year, the adjournment of Congress forestalled any action at that time.

MINOR changes made by the House subcommittee and agreed to by the Army and Navy are as follows:

(1) In regard to negotiated contracts for experimental, developmental or research work and the furnishing of supplies for such work, the agency heads are directed to report to Congress, every 6 months, the name of each contractor, amount of the contract and a brief description of the work on all such contracts.

(2) Negotiated contracts for stand-by facilities must be approved by the President under the amended bill.

Cost-plus-a-percentage-of-cost contracts are outlawed, but cost-plus-a-fixed-fee contracts are authorized in cases where this method is less costly or is more practical to use. The fee may not exceed 10 pct of the estimated cost of the contract, except that a fee not in excess of 15 pct of the estimated cost is authorized in any contract for experimental, developmental or research work and a fee not in excess of 6 pct is authorized for contracts for architectural or engineering services relating to any public works or utility project.

Advance payments are authorized for research and development contracts and in the event of a national emergency.

Small business is guaranteed a fair proportion of the contracts to be let by means of a provision directing purchases to be made in reasonably small lots.

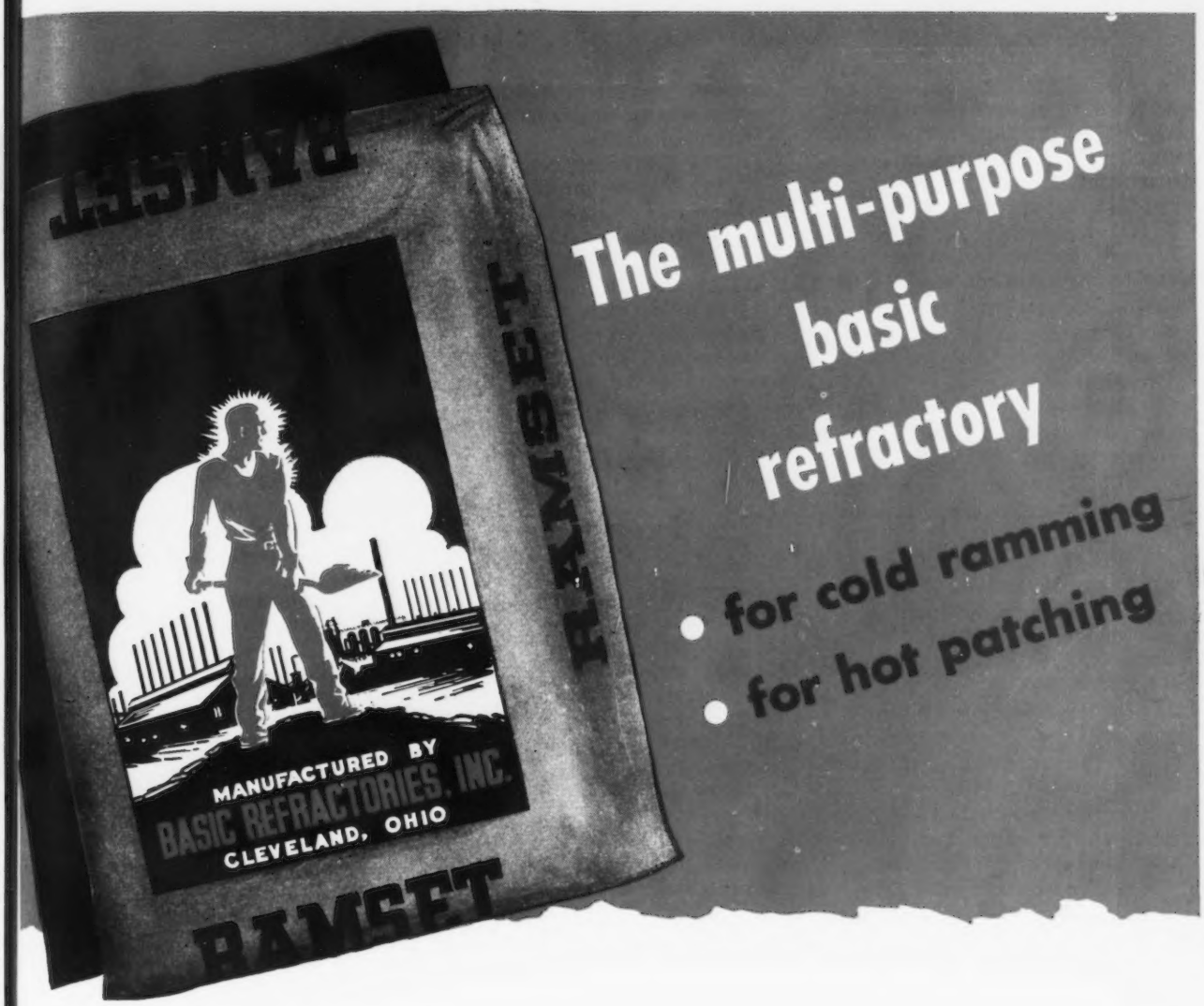
SIMPLY stated, the bill pulls all Army-Navy procurement authority under one statute, sweeping out archaic laws in the process. It makes no radical changes, but rather preserves sound and tested prewar methods of procurement wherever appropriate and adds authority to use, where necessary or desirable for reasons of economy or national security, methods which were used successfully during the war.

The bill had its genesis in the Procurement Policy Board of WPB. In 1945, this Board made a study of the progression from peacetime to wartime procurement legislation which occurred between 1939 and the passage of the First War Powers Act after Pearl Harbor. The bill now under consideration was based largely on a report made by that Board.

In addition to authorizing the negotiation of contracts, the bill also modernizes military procurement methods by eliminating certain weaknesses in the formal advertising method of procurement, and by the repeal of a long list of outmoded statutes. Despite the introduction of various new techniques, Army and Navy officials point out that "an improved advertising method is retained as the principal method of procurement."

Actually, the bill states that all purchases and contracts for supplies or services are to be made by advertising, except for the 14 situations where negotiation may be used.

The provisions with respect to the method, timing, form and character of advertising, which will become the exclusively applicable provisions, are designedly left general in order to afford the War and Navy Depts. the discretion and flexibility to advertise in the man-



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RAMSET is recommended as a cold-ramming refractory for the construction and repair of open hearth and electric furnace bottoms, and as a hot patch material for hearth maintenance, including the building and repair of tap holes.

Hearths have been cold rammed with RAMSET and numerous hot applications have been made. The material has been tested and approved by representative users.

For the use of RAMSET as with all other B.R.I. products, the counsel of Basic Engineers is available at all times. Immediate shipment of RAMSET can be made in any desired quantity.

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ner in which their judgment is best calculated to secure free and full competition. Full discretion to reject all bids is also reposed in the department.

THE legislation, if approved, will permit the Army and Navy to negotiate contracts in the following cases:

(1) During a period of national emergency declared by the President.

(2) If the public exigency will not admit of the delay incident to advertising.

(3) Contracts where the amount involved does not exceed $1000.

(4) For personal or professional services.

(5) Contracts for supplies or services to be used outside the limits of the United States and its possessions.

(6) For medicines or medical supplies.

(7) For supplies purchased for authorized resale.

(8) For perishable supplies or others for which it is impracticable to secure competition.

(9) For experimental, developmental or research work, with the reporting provision added by the subcommittee.

(10) For secret supplies.

(11) For technical equipment where such contracts are necessary to assure standardization of equipment and interchangeability of parts.

(12) Contracts where advertising and competitive bidding would not secure supplies or services of the necessary quality or for supplies of a technical or specialized nature requiring a substantial initial investment or an extended period of manufacture.

(13) Contracts for supplies or services as to which the agency head determines that the bid prices after advertising are not reasonable or have not been independently arrived at in open competition.

(14) For stand-by facilities.

To Establish Regional Set-Aside Lists For Surplus Sale to Vets

Washington

• • • **Effective Mar. 1, WAA will introduce a national network of regional set-aside lists which will simplify sales of surplus war property to veterans. Army or Navy discharge papers are the only instrument necessary for veterans to purchase items especially set aside for their personal use.**

WAA announced that the new regional set-aside lists will supplement national set-aside lists currently used to channel short supply war surpluses to veterans exclusively and emphasized that regional lists will not contain the same items catalogued on the national lists.

WAA Administrator Robert M. Littlejohn has instructed all WAA Zone Directors to effect this policy in a directive which pointed out his desire to close out current set-aside lists by Feb. 28.

"It is practically assured that this target date will be accomplished," he said. "However, as you are well aware, it is my earnest desire that veterans receive every advantage that is due them under the Surplus Proprty Act especially in conjunction with set-aside items.

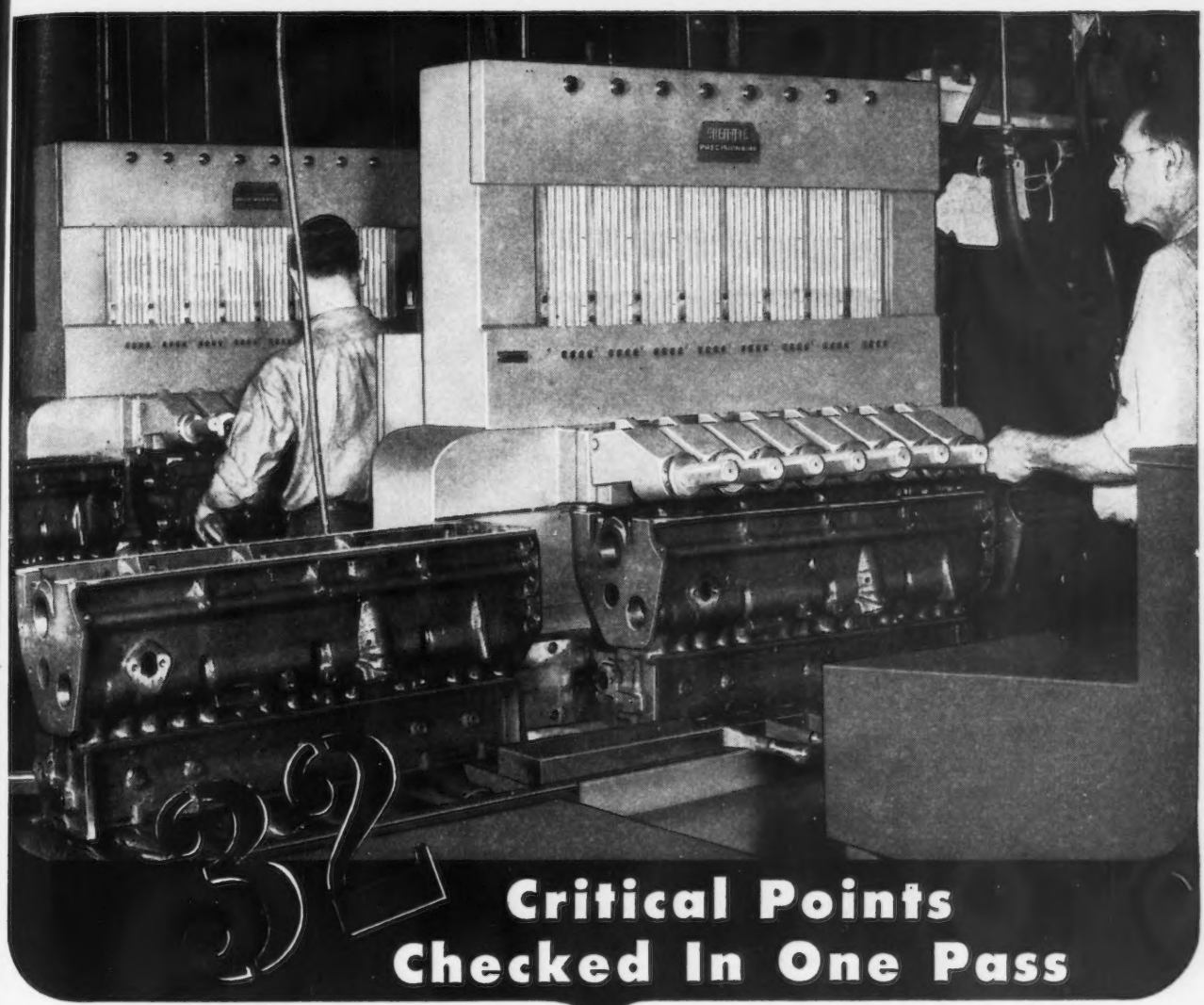
"With this in view, I have directed the elimination of personal use certificates and direct that from Mar. 1, 1947, those items especially set aside for veterans' personal use can be procured by presentation of veterans' discharge papers. By this simplified means it can be assumed that after Feb. 28 we shall have 15 million potential veterans to purchase set-aside items and, in the interest of equitable distribution, it will be necessary to supplement the National Set-Aside List with a Regional Set-Aside List."

THE BULL OF THE WOODS — BY J. R. WILLIAMS

Lists Surplus Installations

Washington

• • • **WAA has just listed 21 wartime installations which recently were formally declared surplus by owning agencies. Among the installations are: Indiana Ordnance Works (Plant # 2), Clark County, Ind.; Allis-Chalmers Mfg. Co. (Nobs # 593), West Allis, Wis.; Hoosier Ordnance Plant, Charlestown, Ind.; Crucible Steel Co. of America (Atha Works), Harrison, N. J.**



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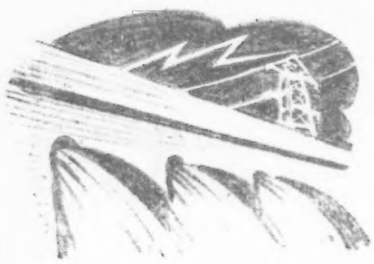
West Coast . . .

ROBERT T. REINHARDT

• Protestants to lower Geneva rate get little support from users who are more interested in immediate lower cost steel than in the justification for charges of "discrimination."



SAN FRANCISCO — The first slight rent in the Pacific Coast steel price umbrella which has long protected local producers and offered some shelter to eastern mills shipping out here is beginning to let in enough dampness to annoy those huddled beneath it.

As Mar. 1 approaches when the new, lower rate on structurals and plates from Geneva, Utah, to the Pacific Coast was to go into effect and comparable reductions have not been granted by the railroads to other local producers and shippers into this market, there is much hurrying and scurrying to stop the leak.

Opinion in the industry here is fairly well divided as to the possibility of the new rate being suspended by the ICC at the request of the group spearheaded by Kaiser Co., Inc., and supported by Bethlehem Pacific Coast Steel Corp. and others. As would reasonably be expected, steel users are presenting a solid front in supporting the reduced rate and opposing anything approaching a suspension.

These steel users have the opportunity to save several millions of dollars per year if the reduced rate is sustained with the result that a forward step will have been taken for eliminating the price differential existing between East and West for the two grades of steel under consideration. While some businessmen are quite frank in sympathizing with Kaiser and Bethlehem in that they too were not granted comparable reductions, they obviously are not willing to let go of a bird in the hand which means dollars in their pockets by opposing a rate reduction.

The California Manufacturers' Assn. reflects to a great extent the thinking of these steel users and the organization is urging the Interstate Commerce Commission to deny petitions filed to nullify the reductions already granted by the Western Pacific, Union Pacific, Denver & Rio Grande Western and Great Northern Railroads. K. T. Norris, president of the association, summed up this thinking by stating:

"Establishment of steel facilities in this area is meaningless unless savings in costs to consumers results. Realistic freight rates, such as the reduction approved by railroads serving Geneva and Coast points, represent a goal long sought by California industry, which for years has been penalized by phantom freight charges."

IN commenting on the position of Kaiser Steel Co. he stated:

"Related rates on the raw materials and finished products of other Coast steel producers should certainly receive equal attention, but that attention should be given separately in accordance with established rate-making procedure, and not be allowed to delay or deny correct rate reductions by railroads serving Geneva."

Mr. Norris has also given assurance to the protestants of the established new rate that the California Manufacturers Assn. will intercede in every way possible to support related adjustments for other producers of Coast steel but is adamant in the demand that the new low rate first be established to benefit the ultimate consumer.

Similar sentiments have been expressed by businessmen up and down the Pacific Coast and the State of Utah, which has long considered the Geneva Steel Co. its own responsibility, has put on its war paint and sent H. W. Prickett, traffic counsel, and Dr. J. R. Mahoney, director of the Bureau of Business and Economic Research at the University of Utah, to Washington to oppose the petitions for suspension. The State Legislature has also passed resolutions urging the ICC to approve the rates and make them effective as first promised.

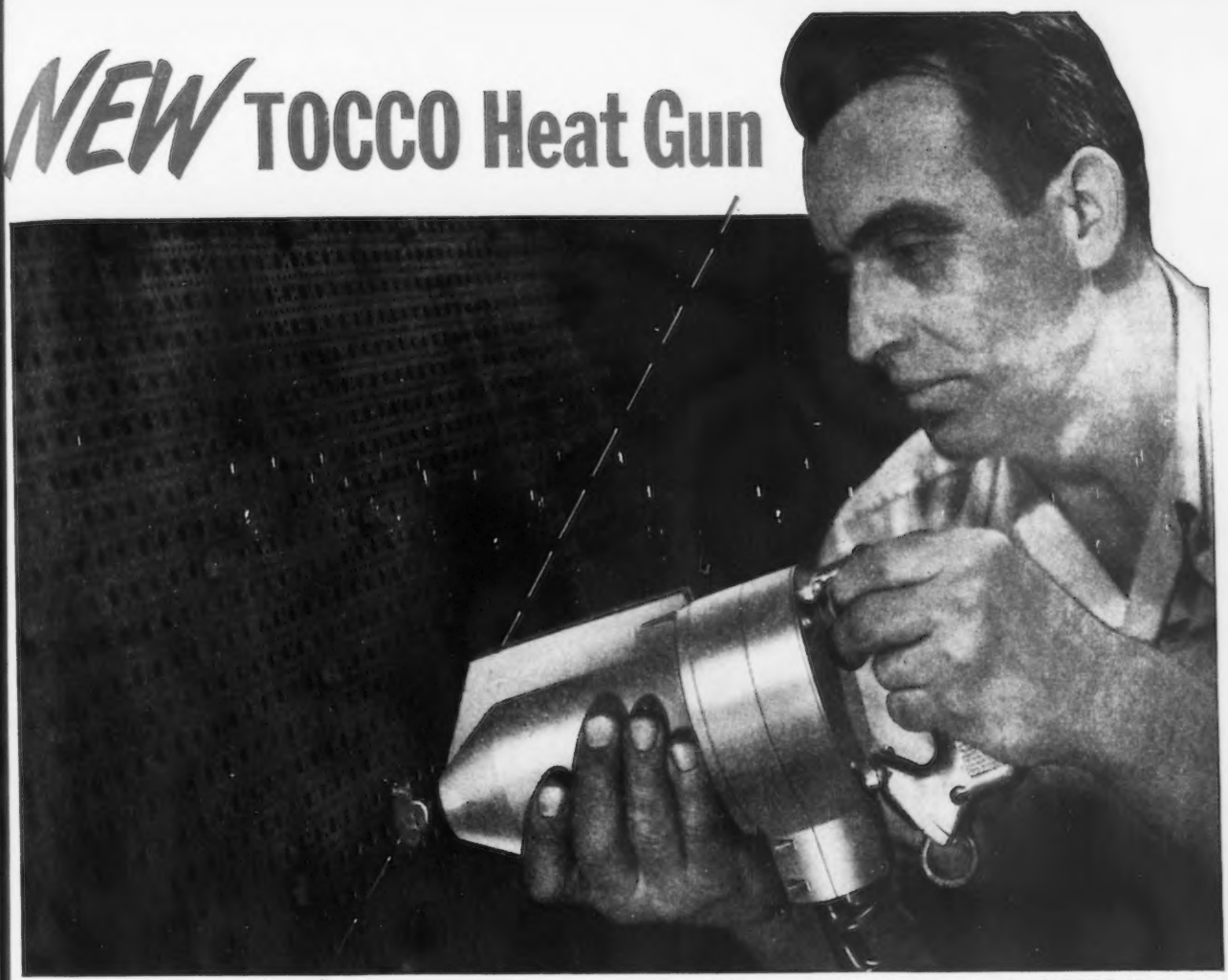
The Los Angeles Chamber of Commerce has organized 150 members including the largest steel buyers of the area and is filing statements with the ICC approving the Geneva rate. L. W. Wright, president of the Western States Council and also general manager of the L. A. Chamber, stated:

"It is our understanding that Kaiser Co. has proposed a reduction in its freight rates on raw materials based on amount of reduction of the Geneva rate. Raw material costs for Fontana should mean lower cost steel from Fontana. However, it is our firm belief that the Geneva rate matter should be settled first and we are consequently spending every effort to see that it is."

UNQUESTIONABLY it is agreed by most observers that the lower rate from Geneva to the Pacific Coast for plates and structurals should effect savings of anywhere from $2 million per year on up on these two products alone for the ultimate consumers. This figure is arrived at roughly by assuming that under present productivity of Geneva that they will produce approximately one-half million tons of plates and structurals per year and assuming that all of this was shipped into the West at a saving of $4.40 per ton, the net gain to western consumers would be approximately $2½ million. Other analysts go a little further and indicate that this is just the beginning of a snowball effect because it is assumed that other producers and suppliers such as Kaiser and Bethlehem would be forced to meet Geneva's delivered prices and additional savings would accrue.

Under the present rate of 70¢ cwt from Geneva to California ports and to Portland, the delivered

NEW TOCCO Heat Gun



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price of plates would be $3.52 cwt and the price of structurals $3.37 cwt. These prices from Geneva compare to Kaiser Co.'s price of $3.46 for plates and $3.41 for structurals. Bethlehem's prices delivered at Los Angeles and San Francisco for plates are now $3.449 and $3.439 respectively. Bethlehem's structural prices are $3.393 for San Francisco and $3.403 for Los Angeles.

If the new rate of 48¢ cwt from Geneva is permitted to go in effect on Mar. 1, this company will be able to deliver plate to San Francisco for $3.29 and structurals for $3.14. Plates could be delivered to Seattle for $3.356 and structurals for $3.206.

It is apparent that if the new rate goes into effect both Kaiser and Bethlehem will have to absorb additional freight to compete. Under present market conditions the Kaiser Co. has been able to maintain higher delivered prices, which were announced several months ago with the explanation that they were made necessary by increased costs.

If the new rate from Geneva is adopted, it will go a long way toward reestablishing the differtial between the East and West prices which were thrown out of balance by the increased rail and water rates which have become effective recently.

Railroad tariff considerations involved in the controversy are freely admitted to be extremely controversial and it is the consensus of unbiased observers that the railroads which have granted the new rates did so to insure and protect the expected revenue which would develop through successful and full-time operation of the Geneva plant.

WHETHER the Interstate Commerce Commission would be justified in insisting on a higher freight rate for the protection of Kaiser Co., Inc., and other protestants at the expense of the ultimate consumer and for the benefit of the railroads is debatable. Whether it is the function of this body to protect consumers at a sacrifice to the carriers and to the detriment of competition is debatable. Further, it is argued that to give the contestants a comparable rate reduction for raw materials and finished products would in all probability upset the rate structure to the point where additional demands from other industries would be forthcoming.

The Union Pacific Railroad which was one of those granting the lower rate is probably in a relatively unhappy position since it is one of the roads which carries a large portion of Kaiser Co.'s raw materials and would again be hard hit by any reduction awarded to that company. The Denver & Rio Grande Western Railroad is in a similar position and according to the Kaiser Co. these two roads will share $110,000 in additional freight revenue resulting from a 30¢ per net ton on the coal haul from Sunnyside, Utah, to Fontana.

The contention of the Kaiser Co. that the rates which are being contested are unreasonably low is not meeting with general approval of steel users who point out that at the hearing at which the Geneva Steel Co. requested this reduction, neither the Kaiser Co. nor Bethlehem objected and indicated only that if such a reduction in freight rates became effective similar reductions would be expected on their own shipments.

The rate granted trucking companies, which is now being adjusted to conform to the 48¢ cwt rate now being contested, is still in effect and actually in use between Geneva and California points. Originally this rate was set at 40¢ cwt and then raised to 42¢ which was said to have been an error and is now to be increased to equal the rail rate effective Mar. 1.

THIS matter of freight rates and cost of steel in the West took on added emphasis last week when the Ford Motor Co. with allegorical brass bands and excellent staging announced here and in Los Angeles that it was a customer looking for suppliers of $50 million worth of parts.

In both cities serious manufacturers studied exhibits of 2600 parts and blueprints in the hope that they might have the facilities —and could get the materials—to participate in mass production of automobile components. In an interview with THE IRON AGE Henry Ford II, and Albert J. Browning, vice-president and director of purchasing, estimated that to manufacture the parts they hope to get out of the West Coast would require approximately 50,000 tons of steel. While not a large amount in itself, when added to an already tight market it becomes formidable.

According to the California Manufacturers Assn. which served as liaison between the Ford company and manufacturers, interest was even greater than expected both at San Francisco and Los Angeles and that there was little question but that contracts for production of many units would be signed within the next month.

Approximately $15 million worth of parts are already being made in this state and if possible Ford will eventually purchase as much as $75 million worth when full production of cars gets underway and if local suppliers can be found. Full production at the Long Beach plant is 300 units per day and at the Richmond, Calif., plant 400 units per day. The Lincoln-Mercury plant being built in Los Angeles and scheduled for operation in October will produce 250 units per day. Mr. Ford stated that if his company can get all the steel needed it will produce 1,200,000 units this year in all of its plants. Total purchases of parts are expected to reach $600 million this year.

When asked about the possibilities of plastics and aluminum replacing steel in automobiles, Ernest R. Breech, executive vice-president, stated that in his opinion plastics would be used more extensively to take the place of wood, and that aluminum was being studied and experimented with by Ford and Alcoa for body use.

Western manufacturers are making the most of this opportunity to get a share of a big market and, as one machine shop owner said in paraphrasing Ford's slogan, "The West is in Ford's future."

Canadian Car Output Up

Toronto

• • • **Production of motor cars** in Canada for January reached the highest total since May of last year. During the month output totaled 11,416 units compared with 9125 in December and 12,755 in May 1946. Production of commercial vehicles in January fell to 7629 from 8223 in December. Production of passenger and commercial vehicles totaled 19,045 units in January against 17,348 in December and 8495 in January 1946.

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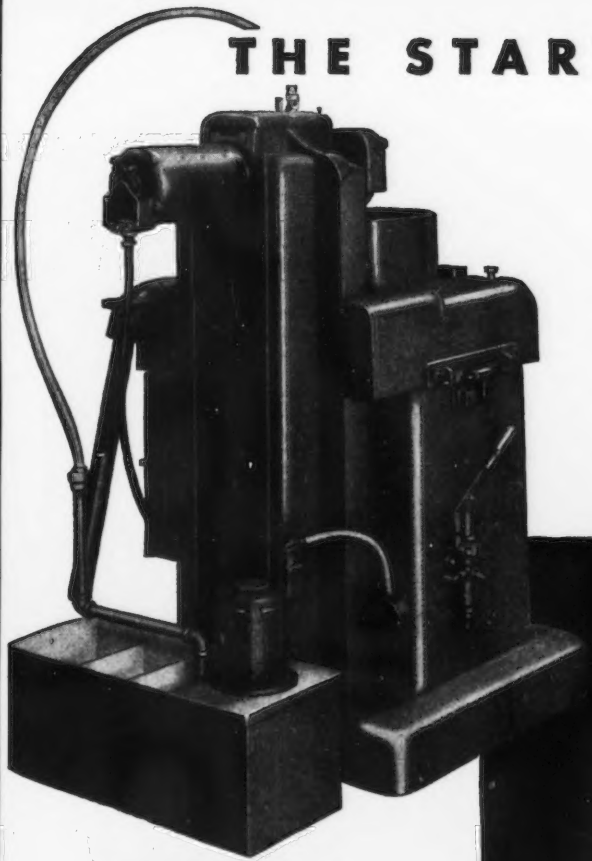

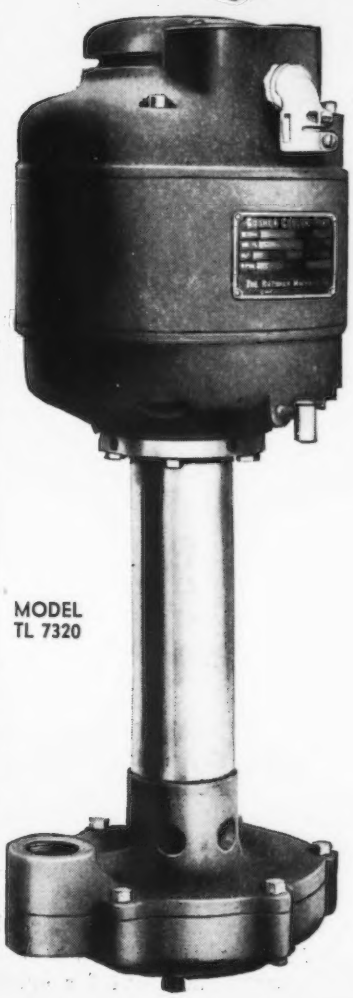

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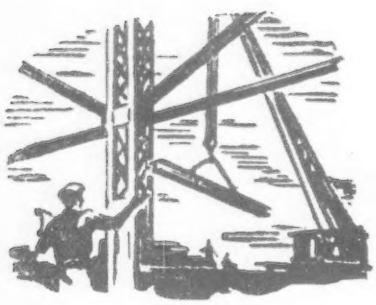
European Letter . . .

JACK R. HIGHT

• Tinplate companies in South Wales combine to form Steel Co. of Wales . . . Government Steel Board has yet to approve location of two cold reduction mills . . . Development program to cost $200 million.



LONDON — After more than a year of hesitation in the face of conflicting political elements, E. H. Lever, chairman of Richard Thomas & Baldwins Ltd., has announced that the program for completely reorganizing the South Wales tinplate trade (see THE IRON AGE, Dec. 20, 1945, p. 86) has still not received the final approval of the British Government as embodied in the Iron and Steel Board. Best information Mr. Lever could offer on the subject in a recent press conference was that, although as far as the companies were concerned the only factors remaining were government approval and financing, the project is before the Board and no indication is given of when the approval may be expected.

It is understood that fundamental questions as to the proper allocation of certain of the cold reduction mills which are to be an important part of the development are the principal issues upon which the Steel Board is as yet undecided. Mr. Lever admitted in the press conference that from purely technical considerations the obvious choice would be to locate the cold-reduction mills at Margam in South Wales on the same site as the hot-strip mill which will be the fundamental unit of the new construction. Inasmuch as the broad program will be disrupting the economies of many small cities in Wales which have been the locations of hand mills, the government requested that consideration be given to locating the cold-reduction mills at other sites.

At present writing it seems definite that the first cold-reduction mill will be located in the Swansea district, and according to a speech which Mr. Lever made recently before a chamber of commerce group in Wales, the second will definitely be located in the Llanelly area. Government circles, however, are a little dubious on this point, and therein may hang the tale of the Steel Board's reticence in announcing any wholesale approval of the program.

Although as far as the steel companies are concerned this development program has been in preparation for 2 years, the Steel Board itself takes the view that it has only been constituted since October and has been faced since that time with a whole broad program of reconstruction in the industry. In approving a development outline which will establish the pattern for the future of the British tinplate industry for many years to come, the Board feels that it is justified in consuming a few more weeks in thrashing out the details to its own satisfaction if it so chooses.

FROM a point of time, however, the second cold-reduction mill is actually some distance away, even though full-scale production work were started immediately on the hot-strip mill. For this reason it seems likely that the first Steel Board action will be some additional approval authorizing the proceedings up to the selection of the site for the second cold-reduction mill.

The development program is to be carried on by the newly formed Steel Co. of Wales, whose existence was disclosed by Mr. Lever. This new firm is to be formed by associating the appropriate assets of Guest, Keen & Baldwins Ltd., Guest Keen Nettlefolds, Llanelly Associated Tinplate Cos. Ltd., and John Lysaght Ltd. The Briton Ferry Steel Co. Ltd., whose name has previously been mentioned in connection with these tinplate developments, has decided not to participate in the program. According to Mr. Lever, smaller tinplate firms in the South Wales area were given an opportunity to participate in the new company, and as a matter of fact one program was proposed to include all of them, but has been superseded by the present plan. He made it quite clear that the tinplate activities of the above listed firms would be the only assets which would be transferred to the new company, and that the present move is not in any respect to be considered a merger of the parent companies, but rather a merger of their tinplate activities only. Each of the organizations will remain in the steel business in its separate lines of products. The Steel Co. of Wales on the other hand will have the responsibility for planning, erecting and managing the new hot-strip cold-reduction plants, and selling their products in the home and world markets.

DUE to the fact that there will be an interval of time before the new mills come into production, the new company is taking over most of the old type tinplate works owned by the companies involved. Considered from an engineering standpoint, Mr. Lever estimated that the full program would require 2½ to 3 years to complete, but in consideration of the complicated factors of government control, plus shortages of materials and labor, he refused to make a definite estimation of how long it would be before the new mills are in full production. He suggested that if the project was given the priority which he desired, 4 to 4½ years might be used in the construction.

To furnish materials for the hot-strip mill the output of existing coke oven and blast furnace works at Port Talbot and Margam will be doubled, and a new melting shop to be erected at Margam will triple the ingot output of the works. The hot-strip mill is to have a weekly output of 22,400 tons and is designed to roll a coil weighing 15,000 lb. The total horsepower to be used at the Margam hot mill will be 46,000. Present plans call for open-

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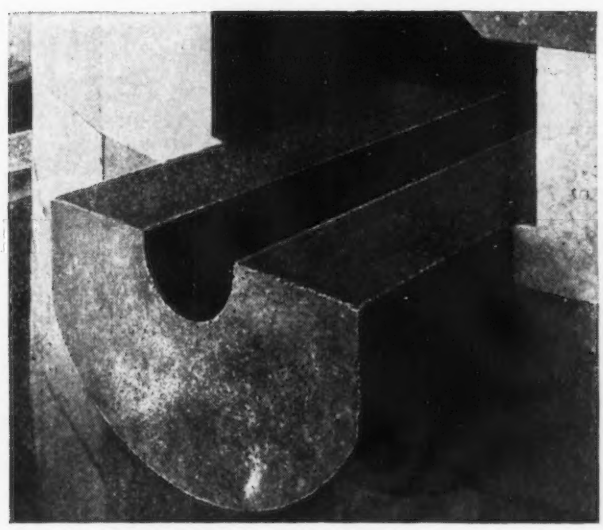

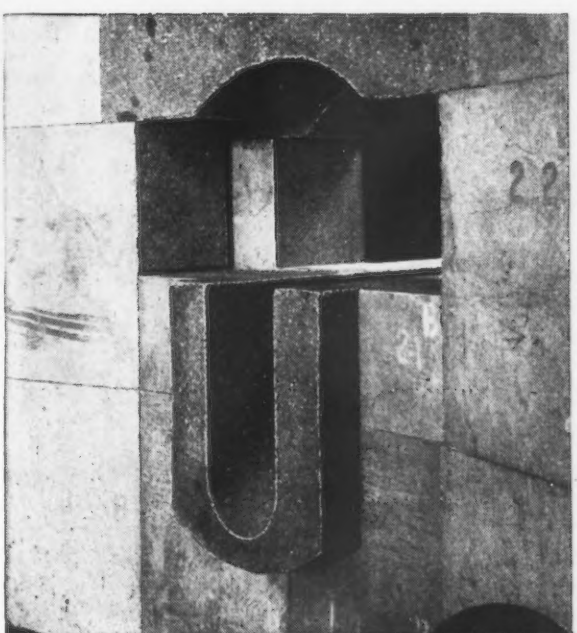

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hearth furnaces as well as reheating furnaces to be oil fired.

In asking the Treasury Dept. for sympathetic consideration in the needs for importing rolling mill machinery from America, Mr. Lever threw an interesting sidelight on the precise relationship of government to industry in the United Kingdom at present. In answer to a question at the press conference, Mr. Lever stated specifically that he did not contend that the Steel Co. of Wales needed the approval of the Steel Board in order to go forward with the plans, but if there is any legal uncertainty as to the powers of the Steel Board in this respect the government has industry so thoroughly strait-jacketed in many other respects that there may be no choice but to submit.

Before Mr. Lever can get a single dollar to spend in America he must go to the Chancellor of the Exchequer for permission, and the obvious reply from that office is "Does the program have Steel Board approval?" In the same fashion the necessity for building licenses and allocations of building materials would send Mr. Lever back to the Steel Board if he were so short sighted as to attempt to evade the Steel Board in his development program.

AS LONG as the firm is able to convince the proper authorities that every effort has been made to purchase all possible machinery in England, there is no doubt but that permission will be granted to buy what is essential in America. Mr. Lever told me that if he can obtain the necessary exchange immediately, he anticipates no problem in deliveries from the U. S. as there is at the moment open space on the order books of the firm which will supply the mill. He fears, however, that if further delays are encountered this situation may not prevail indefinitely.

When the South Wales tinplate development program was first contemplated as a part of the overall 5-year plan for British steel, it was estimated that the development would cost about £37 million (about $148 million), but it is now guessed that at prevailing price levels the cost will be approximately £50 million ($200 million). Mr. Lever refused to estimate at present how much of this sum will be spent in America, but indicated that he anticipated no serious difficulty in raising the required funds.

The valuation of the assets which the new company will take over from existing firms has not yet been started, but the basis for the valuation has been determined. It is planned at present that an independent expert will be called in to assess the value of these assets, and his opinion is to be mandatory on all the parties. The precise financial structure of the new company has not been determined. It is made clear that Richard Thomas & Baldwins will be the dominant organization and are exercising control at the present time.

The hot-strip mill is to be capable of producing the widest strip in England, with a roll face of 80 in. to produce a sheared strip of 72 in. The older South Wales mill at Ebbw Vale produces a 48-in. sheared strip. Each of the cold-reduction mills which are planned has a theoretical capacity of about 7 million boxes of tinplate per year, but Mr. Lever pointed out that future developments would probably make it possible to expand this figure if the market requires it.

I.A.R.A. Issues Report On German Reparations To the Western Allies

Brussels

• • • **Mr. Nigel Sutton,** Secretary General of the Inter Allied Reparation Agency, with headquarters in Brussels, has made public his report for 1946 on German reparation to the western Allies.

The report stresses the need for rapid action by the powers occupying Germany in carrying out the program of German reparation as envisaged in the Potsdam Declaration. Especial mention is made of difficulties which I.A.R.A. encountered during its first year in obtaining release from the Allied Military Government in Germany of adequate amounts of industrial capital equipment urgently needed by war-ravaged countries. The I.A.R.A. assembly, composed of delegates of 18 member nations, has requested the Council of Foreign Ministers to place this matter on their agenda. It has been indicated that reparations will be discussed at the meeting of the Council in Moscow, in the spring.

The report reveals that, although the amount of reparation thus far released for division among the Allies has been unsatisfactory, I.A.R.A. has successfully worked out relatively rapid agreements for dividing German assets made available for this purpose in 1946. To date these assets comprise:

(1) Merchant shipping to the amount of 686,000 gross tons.

(2) Approximately 75,000 machines in 139 plants located primarily in the U. S. zone of Germany. Much of this equipment has already been allocated and is currently being shipped to I.A.R.A. nations.

(3) General purpose machine tools to the value of 90,000,000 Reichmarks. Eighty percent of these tools are in the British Zone, the remainder in the French Zone. Allocations are now going forward.

Tracing the history of reparations, and revealing details of allocations made to the 18 nations of I.A.R.A., Mr. Sutton makes plain his view that only a sharply increased rate of release of German assets by the Allied Control Authority in Berlin will make it possible to avoid grossly exceeding the reparation time-table envisaged in the Potsdam Declaration. The Big Three at Potsdam anticipated completion of the entire reparation activity early in 1948.

Algiers Ore Output Down

Paris

• • • **Iron ore production** at Ouenza, in Algiers, amounted to 1,347,500 tons in 1946, in comparison with 1,485,000 tons in 1939. Exports for the past year totaled 1,336,500 tons. With the completion of repairs to port facilities damaged during the war it is hoped that by 1948 exports may exceed the prewar figure.

Iron ore resources to be open cast mined are estimated to total 82 million tons before it will be necessary to start underground operations. Present plans call for production to be increased to 2.2 million tons annually.

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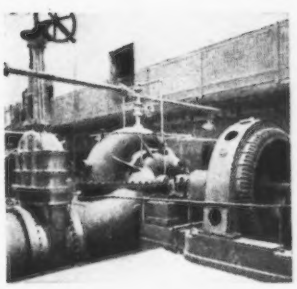

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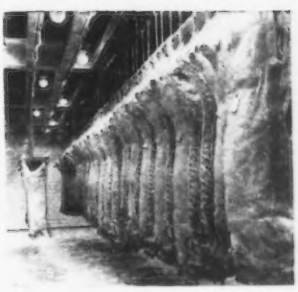

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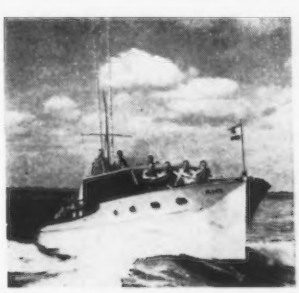

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PERSONALS

FREDERICK U. CONARD, president and general manager, Niles-Bement-Pond Co.

• **Frederick U. Conard,** vice-president of Underwood Corp., has been appointed president and general manager of Niles-Bement-Pond Co., West Hartford, Conn., and will assume his new duties about Mar. 1. Mr. Conard entered the employ of the Underwood Corp. in 1919 as chief engineer of the computing machine division in charge of product design and manufacture. He became vice-president of Underwood in 1938. Mr. Conard succeeds **Charles W. Deeds** who has resigned as president and general manager of Niles-Bement-Pond, but will continue as a director of the company.

• **Walter J. Brosnan** has been elected president of the Worcester Pressed Aluminum Corp., Worcester, Mass. **Cornelius A. Brosnan,** formerly president, has become chairman of the board of directors. Mr. Walter Brosnan comes to Worcester from the Trenton plants of the John A. Roebling's Sons Co. where he was in charge of production planning and cost control work for all operating divisions.

• **Ben T. Cowherd** has been elected vice-president in charge of hardware sales in eastern states of Republic Drill & Tool Co. He has resigned his position as deputy zone administrator of the War Assets Administration. In his new position, Mr. Cowherd's headquarters will be at Republic's eastern factory in New York.

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• **Howard W. Kane** has been elected president of Kane & Roach, Inc., Syracuse, N. Y., to succeed the late William E. Kane.

• **Charles E. Smith,** vice-president, has been promoted to the newly created position of executive vice-president, Towmotor Corp., Cleveland. He joined the company in 1941 as sales manager and has been vice-president since January 1943.

• **Don L. Orton,** general sales manager, has been elected vice-president, Clark Controller Co., Cleveland. He will continue as general sales manager, having been in the company's sales department for 16 years.

• **Anton Erhardt, Sr.** has been appointed chief engineer of the National Tool Co. of Cleveland. During his 40 years' service with the company he progressively advanced from his original place as machine-hand, through all the various departments of the industry, until he became factory superintendent, the office he held at the time of this recent promotion. **James C. Grossman** has been appointed factory superintendent. He takes this new position following 13 years with the Cleveland Automatic Machine Co. There, during the past 4 years, he was production manager.

• **William W. Forst** and **William T. DuRell** have been named assistant managers of the screen and weatherstrip division, Ceco Steel Products Corp., Chicago. **Floyd O. Goodwill** has been appointed assistant general credit manager. **John D. Davenport** and **Harold J. Kovar** were appointed assistant controllers—Mr. Davenport in the accounting branch, and Mr. Kovar in the costs branch. **William H. Ellsworth** has been named to the post of assistant general counsel. **Paul A. Kuehn** becomes assistant purchasing agent, and **David H. Hefele,** assistant advertising manager. **E. C. Bangham** has been appointed assistant manager of the office located at Washington.

• **David E. Johnson** has been appointed a vice-president of the Steel Improvement & Forge Co., Cleveland. Mr. Johnson has been in charge of all production operations of the company as superintendent for many years.

• **John L. Abbott** has joined North American Philips Co., Inc., New York, as application engineer in the industrial X-ray division. He was employed by Wright Aeronautical Corp. from 1941 to 1946 as senior metallurgist.

• **George W. Lockwood** has been appointed plant manager of the Camden, N. J. plant of American Chain & Cable Co., Inc. He has been with the company for many years. Before going to Camden, he was in the general purchase department of the company at Bridgeport, Conn.

• **Paul W. Seiler,** president of Motor Tool Mfg. Co., and formerly president and general manager of Ternstedt Mfg. Co., Yellow Truck & Coach Mfg. Co., and General Motors Truck Corp., has been elected to the board of directors of the Standard Products Co., Detroit.

• **H. A. Roemer, Jr.** has been elected vice-president of the Sharon Steel Corp., Sharon, Pa. Mr. Roemer is president of Detroit Seamless Steel Tubes Co., a wholly-owned subsidiary of Sharon Steel Corp., and will retain that position with headquarters in Detroit.

H. A. ROEMER, JR., vice-president, Sharon Steel Corp.

• **Peter V. Martin** has been appointed sales manager of the metallurgical department of the engineering and construction division of Koppers Co., Inc., Pittsburgh. Mr. Martin was formerly associated with Carnegie-Illinois Steel Corp., serving as a special assistant in the industrial relations department. Previously, he was assistant superintendent of the Gary works and the South Chicago works of Carnegie-Illinois. During 1945 and 1946 he was a member of the American Military Government in the metals section.

• **George W. Kelsey,** general sales manager of the Builders Iron Foundry, Providence, for the past several years, has been made a vice-president of the company. Mr. Kelsey left the U. S. Steel Corp. in 1938 to join the Providence firm.

• **Jerome W. Ingwersen,** general manager of sales at Milwaukee for the A. M. Castle & Co., Chicago, has been made vice-president of the Milwaukee branch to succeed **George Gibbs,** resigned.

• **Perry Francis** has been named general manager of sales by Alan Wood Steel Co., Conshohocken, Pa. Formerly he was West Coast district sales manager. He has been a member of the company for 22 years.

• **E. C. Troy,** chief metallurgist of Dodge Steel Co., Philadelphia, for the past 10 years, has been elected vice-president in charge of research and metallurgy.

• **J. B. Haskell,** manager of sales, rail and track division, of West Virginia Steel & Mfg. Co., Huntington, W. Va., has been promoted to the position of manager, market research and engineering development. Mr. Haskell has been with the company for 24 years. **W. F. Robinson** succeeds Mr. Haskell as manager of sales, rail and track division. He has been with the company for the past 7 years and has been a salesman for the West Virginia territory. **Billy N. Owens,** who served in the Army Air Forces and who was with the company before the war, has been named manager of warehouse sales.

EDWARD A. LINHART, director of industrial relations, Follansbee Steel Corp.

• **Edward A. Linhart** has been appointed director of industrial relations for the Follansbee Steel Corp., Pittsburgh. He has previously been in industrial relations work with the Aluminum Co. of America and later with the Elastic Stop Nut Corp. of America.

• **Deming Bronson** has been appointed sales manager of the central division, American Coach & Body Co., with headquarters in Cleveland. He was recently a consultant for National Tube Co. **Homer A. Feyan,** sales engineer for the company since leaving Army Ordnance in 1946, has been appointed sales manager, midwestern division, making his headquarters in Des Moines, Iowa. **William R. Hall** has been made eastern division sales manager, with headquarters in New York.

• **Victor R. Krause,** former Minneapolis representative of Reynolds Metal Co., has been appointed Milwaukee manager of the firm's aluminum division.

• **James P. Bates** has been appointed chief metallurgist for the Hyster Co. For 3 years prior to joining Hyster, he was supervisor of the materials laboratory for Pratt-Whitney Aircraft Corp. As chief metallurgist for Hyster, Mr. Bates will be in charge of materials specifications and heat treating for the company's three plants —Portland, Ore., and Peoria and Danville, Ill.—making his headquarters in Portland.

• **Frank A. Streiff** has been appointed assistant vice-president in the sales department of the Southern Wheel Div., American Brake Shoe Co. Mr. Streiff, formerly southeastern sales manager for Southern Wheel, and sales representative for the Brake Shoe & Castings Div., will continue to be located in Portsmouth, Va. He has been with Brake Shoe since 1918, serving in various sales capacities since 1926.

• **R. W. Stueve,** formerly general supervisor of labor relations for American Car & Foundry Co., New York, has been appointed assistant comptroller for the company.

• **Richard W. Parsons** has been named technical director of the Mansfield, Ohio factory of the Ohio Brass Co. Mr. Parsons has been in the engineering department of Ohio Brass for 20 years and was chief metallurgical engineer at the time of his new appointment.

• **Otto A. Bendler** has been appointed Detroit district manager of Peterson Steels, Inc., New York, formerly SKF Steels. He succeeds N. H. Schermer. Mr. Bendler was formerly associated with Ternstedt Mfg. Div., General Motors Corp., Standard Products Co. and Carman Adams Associates.

• **Ritner W. Tomlinson** has been appointed superintendent of the Easton, Pa. plant of the Pennsylvania Salt Mfg. Co. Mr. Tomlinson previously was plant superintendent of the Pennsalt plant at Cornwells Heights, Pa., and the Greenwich plant in Philadelphia.

• **Edward L. Patton,** manager of glass advertising and sales promotion since Pittsburgh Plate Glass Co. created the department in 1934, has been appointed consultant on glass advertising. He has been associated with the firm for more than 23 years. Succeeding Mr. Patton as manager of glass advertising and sales promotion is **Robert Wardrop.** Mr. Wardrop has served as assistant manager of the department since his separation from the U. S. Army early last year. Headquarters of the company are in Pittsburgh.

• **L. F. Holfelder** has been appointed factory representative for the brush division of the Osborn Mfg. Co., of Cleveland, to serve the Cincinnati, Louisville and Nashville areas. Mr. Holfelder, who recently was discharged from the U. S. Army, will make his headquarters in Silverton, a suburb of Cincinnati. Prior to his service in the Army, Mr. Holfelder was connected with the Central National Bank of Cleveland.

• **R. G. Mumma,** formerly manager of the tap division of the Landis Machine Co., Waynesboro, Pa., has been named assistant secretary. **R. E. Yingling,** formerly in charge of the New York territory, has been appointed assistant sales manager.

• **L. A. Adams,** who has been district manager, southern territory, for Chicago Vitreous Enamel Product Co., Cicero, Ill., since 1932, has been appointed assistant manager, sales and service. In his new capacity he will make his headquarters in Chicago.

• **C. Stuart Haagensen,** former assistant to the manager, has been appointed employment manager of the Allis Chalmers Mfg. Co.'s West Allis, Wis., works to succeed **James Onarheim,** who has returned to the sales department.

• **C. E. Jones** has been appointed vice-president of Agaloy Tubing Co., Springfield, Ohio. He has been associated with the company since his release from the Navy.

• **Carl F. Schultz,** for 18 years a production engineer at Oldsmobile, has been appointed resident engineer of the Lincoln-Mercury Div. of Ford Motor Co., Dearborn, Mich. Since 1925 Mr. Schultz has been associated with Oldsmobile as a chassis and body engineer. During the war he was attached to the procurement division. He also served as national assistant manager of parts and accessories for Oldsmobile.

• **Eldon E. Achberger,** works manager of the Perfex Corp., Milwaukee, has been elected a vice-president of the firm. He joined Perfex in 1934 as methods engineer and has occupied successively positions of chief methods engineer, machine superintendent and plant superintendent.

• **Robert R. Horton,** former district sales manager for the Heil Co., Milwaukee, has been appointed secretary and sales manager of the Sealy Mattress Co., Milwaukee.

• **Albert O. Grotenhuis** has been appointed by Moe Bros. Mfg. Co., Milwaukee, as district manager to cover Wisconsin, Michigan and three adjoining states with headquarters at Chicago.

• **Thomas F. Clifford** has been made purchasing agent of Botwinik Bros. of Mass., Inc., Worcester. Prior to his association with the firm Mr. Clifford was supervisor of costs for the Reed-Prentice Corp. and then expediter and overseer of purchases.

• **C. E. Brown** has been made district manager of the New England branch of the Penflex Sales Co., sales division of the Pennsylvania Flexible Metallic Tubing Co., with headquarters at Boston.

• **John A. Kobelenz** has been appointed district sales representative for the northern section of Ohio of the O. K. Tool Co., Inc., Shelton, Conn. He succeeds Frederick Schroeder, deceased.

• **James H. Dray** has been appointed assistant to the vice-president in charge of operations of the Colonial Radio Corp., Buffalo, a subsidiary of Sylvania Electric Products, Inc. In his new post, he will act in an advisory capacity in procurement of raw materials and component parts. He formerly was director of purchases for Sylvania's fixtures division.

• **George Horton** has been made office manager of the Detroit plant of the Quaker Chemical Products Corp., Conshohocken, Pa. He comes to Quaker from the Chrysler Motor Corp.

...OBITUARY...

• **Charles E. Coats,** president of Coats Machine Tool Co., Inc., Scarsdale, N. Y., died recently.

• **Harry Scullin,** 79, chairman of the board since 1944 of the Scullin Steel Co., St. Louis, died Feb. 15.

• **Harmon O. Nelson, Sr.,** connected with the Whitin Machine Works, Whitinsville, Mass., in an executive capacity for about 40 years, died suddenly Feb. 11.

• **Arthur E. Palmer,** field representative for the engine sales department of Caterpillar Tractor Co., Peoria, Ill., since 1937, died Jan. 7.

• **Robert Jones,** 53, auditor of disbursements for the Alabama Power Co., Birmingham, died Feb. 12 after a short illness.

• **Mahlon E. First,** a director and the executive in charge of engineering and design of material handling and processing equipment at C. O. Bartlett & Snow Co. for the past 26 years, died Feb. 9.

• **Austin G. Melcher,** vice-president and director of the Hoskins Mfg. Co., Detroit, died recently. Mr. Melcher was with the company since its organization in 1908.

• **James M. Bray,** chief roll designer for United Engineering & Foundry Co., Pittsburgh, died Feb. 12. He was with the company 38 years.

• **George H. Dunlap, Jr.,** 64, vice-president of the Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., died Feb. 14 after an illness of several months. Mr. Dunlap had been associated with the company since 1917.

• **Frederick Schroeder,** for many years Ohio manager of the O. K. Tool Co., Shelton, Conn., died recently after an illness of 6 months. Mr. Schroeder was the oldest employee of the company, in point of service, joining the firm in 1907.

• **Robert D. Heflin,** 63, for about the past 25 years direct sales representative of Gisholt Machine Co. in charge of the firm's branch office in Newark, N. J., died suddenly on Jan. 23.

Dear Editor:

MAGNITOSTRICTIVE MATERIAL

Sir:

We want to conduct fatigue tests on nonferrous machine elements (specimens which are not iron) which have natural frequencies from 1000 to 10,000 cycles per sec. An electromechanical transducer (moving coil type) driven by an electronic power amplifier is limited to an acceleration of about 50 gravities because of the high inertia forces involved. This means that, as the frequency goes up the allowable vibratory amplitude decreases. It is known a moving coil vibration motor of 500 w capacity would have an amplitude limitation of ±0.025 in. at 100 cps and ±0.00025 in. at 1000 cps, and it is thought perhaps a magnitostriction transducer could be designed for 1000 to 10,000 cps. If a material can be obtained which will translate the electrical force to a mechanical force with the efficiency of a moving-coil transducer (15-25 pct), a magnitostriction transducer should admirably satisfy our requirements. This efficiency should be accompanied by a change in length of the magnitostrictive element of ±0.010 in. at 10,000 cps.

The problem upon which your advice is requested boils down to this: Find a magnitostrictive material which will satisfy the following requirements: (a) a percent elongation (i.e. for any given length of bar the change in length caused through magnetic flux expressed as a percentage of the given length) which will permit a ±0.010 in. amplitude in a reasonable length of bar (say, anything up to 2 ft); (b) a material in which an increase in magnetic flux will cause a corresponding increase in elongation of it (thus permitting smooth amplitude control) but will not show reversal of characteristics with the increase of flux density; (c) translation efficiency not less than 10 pct, so that a force of ±100 lb, or greater, may be obtained from the reasonably sized unit.

If you can furnish this information, we would be most appreciative of your assistance.

GORDON M. ROBERTS
Librarian, Engineering Div.
Ranger Aircraft Engines
Farmingdale, N. Y.

● A magnitostriction transducer in the form of a magnitostriction oscillator using a magnetizable rod vibrated by compressional waves transmitted end to end is not too difficult to set up. To build one which would develop an amplitude of ±0.010 in. in a bar length of 2 ft might be possible. Since the change in length of a magnetizable rod is not linear with magnetism and since the change is quite small, it will be necessary to use resonant frequencies and adequate lengths in order to obtain the desired amplitude. Resonance frequencies in a bar freely suspended from its center are inversely proportional to the length of the bar. In the case of nickel or steel, a frequency of 1 kilocycle would be obtained from a bar about 5 or 6 ft long and a frequency of 10 kilocycles in a bar about 1 ft long. The amplitude desired would be difficult to obtain in the short length required for the higher frequency. Various damping and clamping means might be developed to overcome some of the difficulties.

To obtain a force of ±100 lb at a frequency of 10 kilocycles and an amplitude of ±0.010 in. would require a power unit of about 20 kw. Such a unit could be built experimentally at a cost of $10,000 to $15,000. Having the power unit, it would be possible to embark on a research program which might lead to some or all of the answers that you want. A research program of about $3000 per month for a period of 6 months to a year might be necessary and only partial solutions need be expected in that time.

Although much has been written on magnitostriction, it seems that nothing has been done in the field you propose and considerable original investigations will be necessary. It seems that the idea is feasible of development but whether or not it is economic is a great question.—Ed.

WHAT IS NALOY?

Sir:

We do not find the name Naloy listed in your new trade name directory, and would suggest that this material be incorporated in the list, and that you advise us as to the nature of this material and the name of the manufacturer.

R. H. HALLAGAN
Firth-Sterling Steel Co.
Detroit

● Can some reader identify Naloy?—Ed.

FLUORIDE FUMES

Sir:

It has been called to my attention that the article, "Fluoride Fumes Cloud Ford Labor Picture; Strike Looms," appearing in the Nov. 7 issue, pp. 106-107, has left an erroneous impression in regard to the matter of the standard used in determining the actual conditions existing in the controversy. The statement to the effect that 25 mg per 10 cu m of air is the legal standard is misleading in two important respects. First, there is no standard having the status of law. The controlling factor is the opinion of the inspector, in this case Lloyd D. Utter of the Michigan Dept. of Labor and Industry. The Div. of Safety Engineering to the Dept. of Labor and Industry, of which I am chief, reporting to the Commissioner of Labor, acts as an advisory and consulting group to the inspection service.

In the second place, the internal departmental yardstick for determining where safety leaves off in the use of soluble fluorides is 10 mg per 10 cu m of air. While we fully recognize that some authorities use 25 mg per 10 cu m, we wish to re-emphasize that based on unpublished research information and experience in our possession, the Michigan Dept. of Labor and Industry will, and has used 10 mg of soluble fluoride per 10 cu m of air.

In view of the fact that our views have been incorporated in your article, as interpreted by both Ford Motor Co. and the president of the Ford Local we would appreciate your correcting the two erroneous interpretations of our position. We are happy to have been able to help both parties arrive at a judicial decision which kept the men on the job and the company in production and have nothing to say about the various interpretations which have been placed on our report except in the two instances mentioned.

GORDON C. HARROLD
Chief Safety Engineer
Dept. of Labor and Industry
Lansing, Mich.

● We appreciate the trouble you have taken to clarify the question of the Ford furnace situation and regret any misunderstanding that may have arisen from the statements in the article.—Ed.

VACUUM MELTING

Sir:

I would appreciate receiving a copy of the article, "Vacuum Melting in Germany," by George T. Motock which appeared in the Dec. 12 issue.

C. A. LIEDHOLM
Chief Engineering Metallurgist
Curtiss-Wright Corp.
Caldwell, N. J.

KROMITE

Sir:

We do not find the trade name Kromite listed in your new trade name directory and would suggest that this material be incorporated in the list, and that you advise us as to the nature of this material and the name of the manufacturer.

R. H. HALLAGAN
Firth-Sterling Steel Co.
Detroit

● Kromite buffing and polishing compounds are made by S. A. Day Mfg. Co., Inc., 1485 Niagara St., Buffalo.—Ed.

PROSPERITY

Sir:

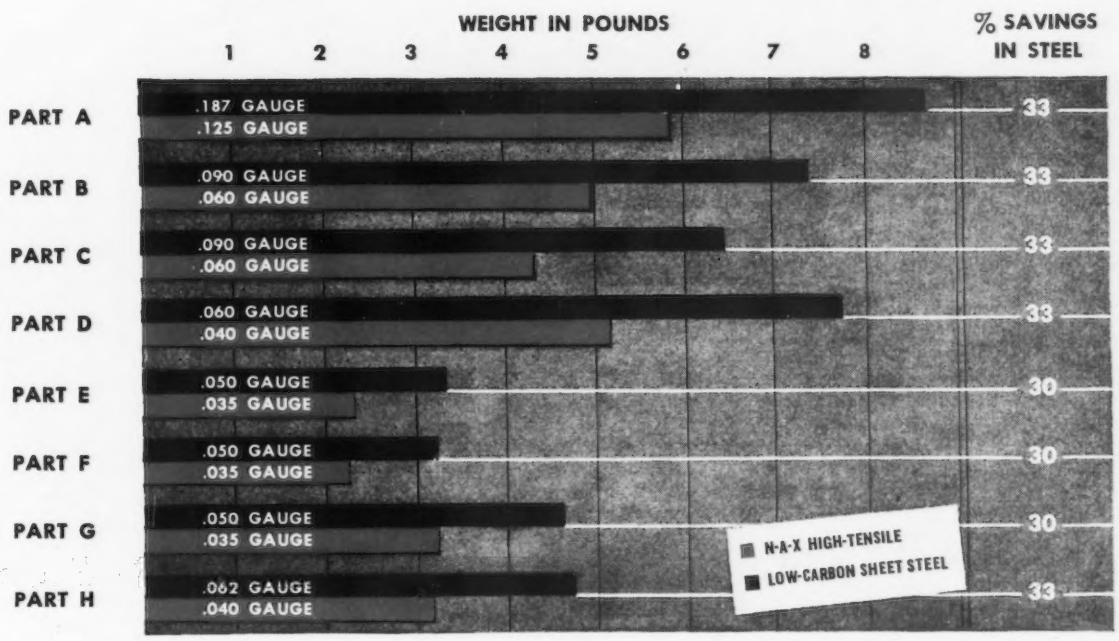
Will you please send me three copies of the article, "Way to Prosperity," by Beardsley Ruml, which appeared in the Jan. 2 issue?

CHARLES W. LUEDERS, JR.
Assistant to the Vice President
Dodge Steel Co.
Philadelphia

THE NEW ARITHMETIC IN STEEL

ACTUAL PRODUCTION FIGURES MORE THAN PROVE IT:

3 TONS N-A-X HIGH-TENSILE > 4 TONS CARBON SHEET STEEL



We have claimed that N-A-X HIGH-TENSILE can effect a 25% saving in steel. This graph shows the results when one leading manufacturer switched from carbon steel sheets to N-A-X HIGH-TENSILE . . . utilized thinner sections with no sacrifice of strength... and saved up to 33% in steel.

The change was made because of the unique combination of properties of N-A-X HIGH-TENSILE. With its 50% higher physical properties, it has exceptional formability for a high-strength steel, and can be formed and drawn into intricate shapes with little or no change in dies or machinery adjustments. It has excellent weldability, great impact toughness, high fatigue- and corrosion-resistance. These qualities not only provide a more durable product, but often effect economies in fabricating and handling. Based on *over-all costs,* N-A-X HIGH-TENSILE compares favorably with carbon sheet steel.

Today's supply of N-A-X HIGH-TENSILE is insufficient to meet the demand, but we are looking forward to the day when we can fill your needs. When that time comes, our engineers and metallurgists will be glad to work with you to determine just how much steel you can save by using N-A-X HIGH-TENSILE.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL

GREAT LAKES STEEL
Corporation

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

Industrial News Summary...

- **Steel Corp. and Union Begin Wage Talks**
- **Order Volume Shows No Signs of a Drop**
- **Dept. of Justice Studies Scrap Prices**

AFTER several weeks of discussions involving non-economic factors leading towards a new wage contract, the U. S. Steel Corp. and the United Steel Workers of America this week began an initial approach to the wage question and other economic factors to be included in the final contract. While both sides have at least 2 months to go before the end of the current contract extension, it is expected that a satisfactory agreement on wages and some social benefits will be reached before that time—possibly by the early part of April.

Both the steel industry and the union are already facing a different set of circumstances than was the case when negotiations opened more than a month ago. The industry has suffered a substantial increase in the price of scrap, one of the major raw materials in the present high rate of steel production, while the union on the other hand is currently facing a cost of living which is approaching the peak established last fall.

While these two major factors will have considerable bearing on the progress of the wage negotiations there is little doubt that a moderate increase in wages will be granted and that the time between now and the agreement will be spent by each side in presenting its case and deciding how far each will go toward an effective compromise. While the portal-to-portal suits are still considered serious by industry and labor leaders, each group expects that the Supreme Court and Congress will straighten out this frankenstein.

COMPETITION for scrap this week became so frenzied that quotations in secondary areas were approaching those in major scrap consuming districts. This situation was bound to occur as a defense measure on the part of consumers in those areas in an effort to retain as much scrap for their own use as possible. Substantial increases in the price of heavy melting steel have occurred in Birmingham, Detroit, Philadelphia, Boston, New York and Cincinnati as consumers in those areas attempt to eliminate "raiding" by scrap users from other areas.

While scrap market prices are unchanged this week at Pittsburgh and Chicago, the markets there are vulnerable to an upward movement. An increase in the price of heavy melting steel in Philadelphia this week moved THE IRON AGE scrap composite price from $33.75 a gross ton to $34.08, up 33¢ a gross ton.

The Dept. of Justice this week has under consideration complaints about high steel prices and high scrap prices and is proceeding informally in the matter. It is not known what action the department can or will take. The complaints involve high steel prices charged by steel brokers and warehousemen who have never before sold steel. The complaints have come from consumers and members of Congress.

IN an effort to round out high production schedules and make possible the manufacture of minor parts, the lack of which is holding up the assembly of manufactured products, many users of steel are still being forced to pay prices for small tonnages of material which run as much as two to three times the normal or warehouse steel quotation. The sources of this high priced steel include redirected export tonnage and material from manufacturers whose quotas from the mills are in excess of their actual needs, as well as scrap-steel tie-in deals. It is practically impossible for steel companies to check completely the ultimate use of steel shipments sent to bona fide customers.

Steel ingot output this week was maintained at 94.5 pct of capacity unchanged from last week's peak level. Indications are that this high tempo will continue for some time. While weather conditions have affected some operations, this situation is considered to be temporary.

This week there were no general signs of a slackening in the volume of new steel orders. In most cases order volume so far this month was ahead of the same period a month ago and bookings placed since the first of the year were running more than 50 pct ahead of the same period a year ago. Heaviest demand continues in the flat-rolled categories and there are some steel sources which insist that certain types of flat-rolled material will remain tight throughout this year.

AS evidence of long-term planning, steel salesmen from many major companies for several weeks have been knocking on consumers' doors in an effort to convert them into permanent customers. Likewise every effort is being made to retain newcomers who do not come under the classification of "old timers." Emphasis on these contacts surrounds the probable consumer demand in 1948 and little hope is held out for any change in delivery promises during the first half of 1947.

Despite reports to the contrary, the railroad industry last year obtained about the same percentage of steel supplies as it did in prewar years, and since the total steel produced last year was greater than in 1939, actual tonnage of steel shipped to the carriers was higher. During the latter part of 1946 and early this year steel shipments to the railroads were increased on a percentage basis and further expansion will be made on these shipments during the second quarter of this year. Consumers other than railroads will be notified of a cut in their quotas in order to make possible the increase to the railroads. Last October, the latest date for which actual distribution figures are available, the amount of steel shipped to car builders for freight car construction alone was slightly more than 165,000 tons—the figure which is now considered to be a goal.

• **ARABIAN OIL LINE**—Geneva Steel Co., U. S. Steel subsidiary, will furnish close to 300,000 tons of plates for a 30 and 31 in. pipeline to be fabricated by Consolidated Steel Corp., Los Angeles, for the Arabian-American Oil Co. The line will be 1100 miles long and will run from Saudi-Arabia along the Persian Gulf north and west to some point on the eastern shore of the Mediterranean Sea. To save shipping space the 30 in. pipe will be put into the 31 in. sizes. Consolidated is now completing a 30-in. portion of a natural gas pipeline to run from Texas to California.

• **VACUUM CLEANER SALES**—Factory sales of standard size household vacuum cleaners set a new record in 1946 of 2,289,441 units or 37 pct greater than the industry's best prewar year of 1941 when 1,670,129 units were produced, according to Vacuum Cleaner Mfg. Assn.

• **TEXAS PIG IRON**—Indicating an early shipment of Texas pig iron to the Birmingham district, the first in history, a railroad freight rate on pig iron from Houston to Birmingham has been approved by the Southern Freight Assn. and the Southwestern Freight Assn. following request by Sheffield Steel Co., Houston. The two associations have approved a rate of $6 per ton of 2240 lbs, minimum carload of 75,000 lbs. It is proposed to file an application with the Interstate Commerce Commission for sixth section relief so the rate may become effective on short notice. At present there is no commodity rate on pig iron from Houston to the Birmingham district. Local sources say that iron from Sheffield Steel Co.'s DPC furnace probably will go to pipe plants.

• **MERCHANT PIG IRON**—Several producers of merchant pig iron are reported to be considering raising prices. It is believed that the increase will be in the neighborhood of the $3 a ton boost announced by Brooke late in January and that it will become effective throughout the industry in the very near future. Increased ore prices, coupled with higher coke costs and a probable steel union wage increase are cited as factors which cannot long go unrecognized by furnaces making merchant iron.

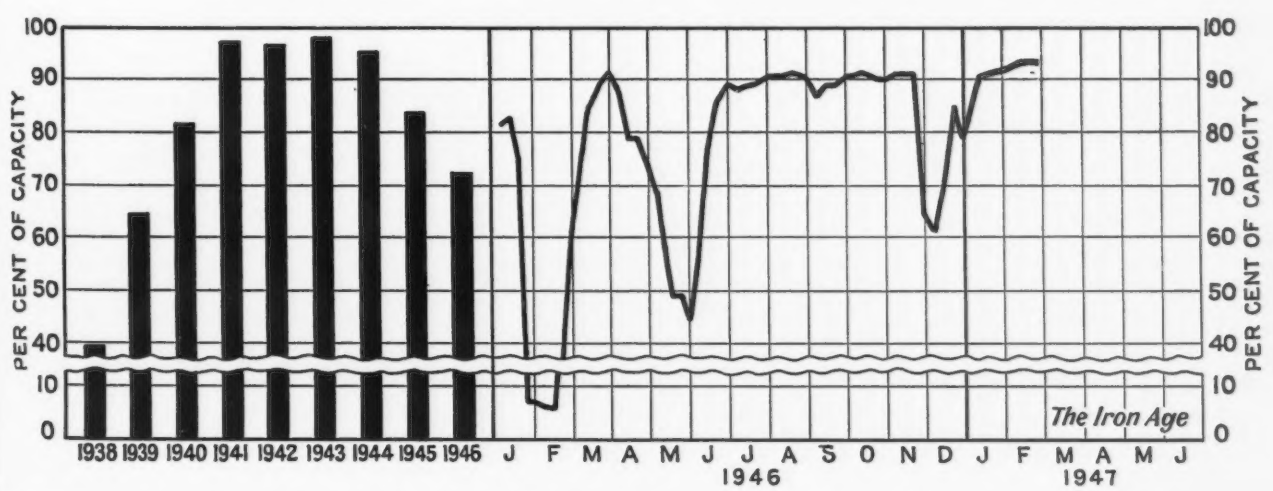
• **STEEL RECORDS**—The Homestead district works of Carnegie-Illinois Steel Corp. representing about one-third of the U. S. Steel Corp.'s steelmaking capacity, broke an all-time record by producing 365,261 tons of ingot. The 45-in. slabbing mill broke its previous record by rolling 146,054 tons of slabs. The McKees Rocks wheel plant produced 23,959 railroad car wheels. While total employment of the district works is up from the war period, when the last records were established, total manhours of work were somewhat below those of the last record. The company stated that the old crews had returned from the services and that teamwork was responsible for the new records.

• **PIPELINE VERSUS RAIL**—The Texas Railroad Commission has approved a 1 year, multiple car, intrastate freight rate on the movement of gasoline to enable the railroads to compete with the pipeline carriers.

• **NEW PLANT EXPENDITURES**—The highest private expenditure in our history for new industrial plant and equipment were made in the fourth quarter of 1946, according to the National Industrial Conference Board. Most postwar plant expenditure financing, says the analysis, was made possible through the use of accumulated liquid assets and not through the issuance of new stock or incurring new debt. Bank loans were evidently not relied upon to any extent to finance additions to fixed plant and equipment. The survey points out that accumulated cash and other current resources were by far the most popular method of financing capital expenditures.

• **SURPLUS LIQUIDATION**—Liquidation of surplus property by WAA in January amounted to slightly more than $1 billion in original cost, Administrator R. M. Littlejohn said in his first monthly report for 1947. Sales by major categories included $337 million in real property; consumer and producer goods, $529 million; and, aircraft and parts, $119 million.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 18....	101.0	94.0*	91.0	90.0	97.0	104.0	100.0	99.0	103.0*	98.0	106.0	73.0	95.0	94.5
February 25....	101.0	92.5	91.0	90.0	98.0	104.5	100.0	99.0	102.5	103.5	106.0	76.5	95.0	94.5

* Revised.

Representatives to World Trade Conference Not Yet Selected

Washington

• • • **Although the** World Trade Conference at Geneva in April is scarcely 6 weeks distant (THE IRON AGE, Oct. 17, p. 80), the seven government agencies participating—the Tariff Commission and Depts. of State, Commerce, Agriculture, War, Navy and Treasury—profess as yet to be undecided as to who will be their respective tariff-bargaining representatives, although these will number in the hundreds.

Best unofficial advice is that they will be picked largely from the ranks of experts, advisers, specialists or economists of the agencies, the anonymous little men who do the actual work and are supposed to know what it is all about. They will form a Tariff Agreements Committee, according to the same sources, which will include the inter-agency Committee for Reciprocity Information and will be further broken down into a dozen or so negotiating teams.

Those selected by the State Dept. operate largely on a "by country" basis; that is, each State expert is familiar with the trade of a specific nation; those from the Tariff Commission have been trained on a "commodity" basis; that is, to be familiar with a particular item such as metals, wool, etc., rather than by "industry." Commerce will offer the nearest approach to this type representation.

Bargaining is expected to be on a day-to-day basis between the individual countries, such as the United States and England, England and Brazil, Russia and the United States, and so on. However, the conference proposes that whatever agreements are negotiated must be applied to all nations alike since a major purpose of the conference is to kill off the preferential system. If this rule is actually followed the hottest fight that will be made in all probability will concern tariff preferences different countries grant among themselves.

Great Britain is extremely opposed to giving up empire preferences and the definite view here

Fight Expected Over System Of Preferential Tariffs Used by Countries

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By KARL RANNELLS
Washington Bureau

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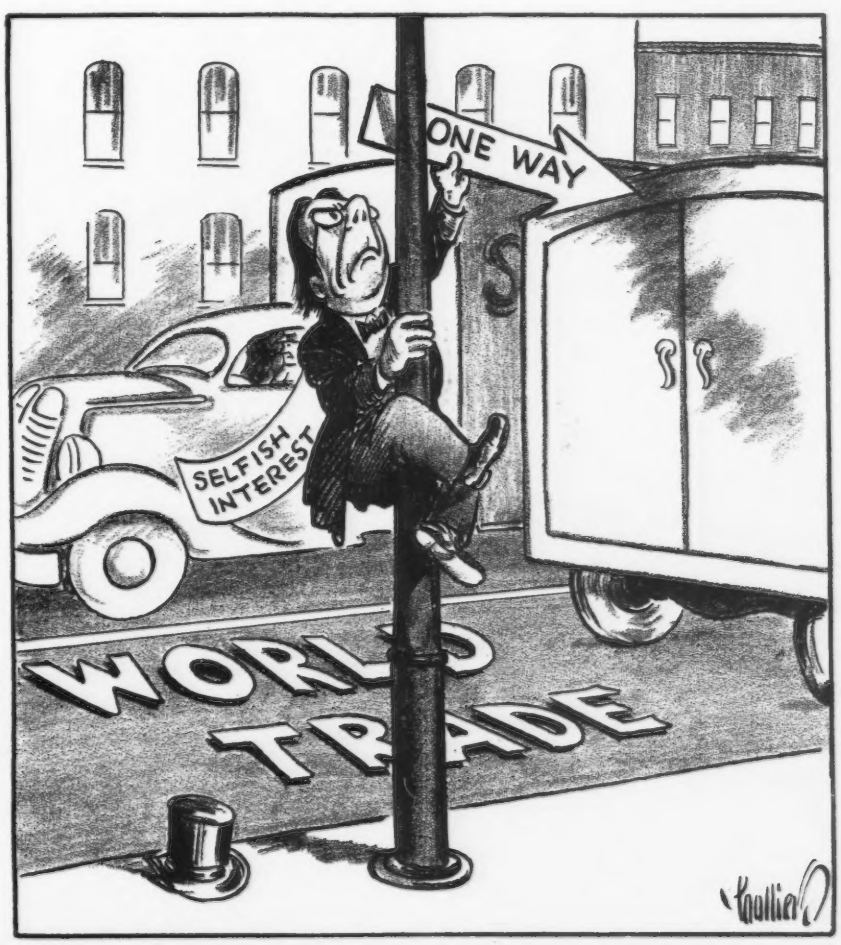
is that she will not do it. Under the terms of the recent $3¾ billion loan the United States made to her Britain agreed to modify her preferential system. Just what modification will be offered has not been outlined. It was also agreed that England could abandon wartime currency and trade discriminations generally. The nature of changes in this direction also has not been revealed.

Non-signatory nations which seek to come into the world group later must accept and put into force whatever agreements are reached at Geneva.

Despite pressure, opposition, and loud oratory on and off Capitol Hill, it is generally accepted here as settled that Congress will not take action which would seriously handcuff the State Dept. for the conference.

First of all, the conference itself is a product of American

A Bad Sign



ideas and proposals; also, formation of the proposed International Trade Organization is part and parcel of the Bretton Woods agreements. It is felt that no matter how hard it may be to take, the United States can scarcely afford to lose face by reneging to any appreciable extent on one of its own proposals.

Agreement by the Administration to permit tariff commission authority to review tariff slashes made by the State Dept. under the Reciprocal Trade Act ties in with recommendations made by two Republican Senators, Vandenberg of Michigan and Millikin of Colorado. The move was designed to check widespread Republican attacks on the program.

Senators Vandenberg and Millikin have been working with Undersecretary of State Clayton, who went to the White House for approval of the compromise by President Truman. The escape clause to be written into agreements was a Vandenberg-Millikin proposal but was accepted long ago by the agreements and permits the government to withdraw tariff reductions if they prove injurious to American industry.

The power given the Tariff Commission allows it to hold public hearings so that industry can express its views on tariff cuts. Recommendations by the commission would go to the President, who would decide whether the tariff cuts should stand or be rejected.

Nevertheless, acrimonious discussions have been touched off. The State Dept. recently released a long list of some 3000 items or so which it has selected for use in its horse-swapping operations at Geneva. (THE IRON AGE, Nov. 21, 1946, p. 113). In response to inquiries as to how this would be carried out, it was stated that it would be on an item-for-item, day-by-day basis "according to the progress of the conference."

Fanning the flames were the recently completed tariff hearings held by the Committee for Reciprocity Information. Some 1000 or so briefs were filed by individuals, business and trade and labor groups, most of which have been carefully shrouded with secrecy by the Committee on the grounds that they were "confidential" documents.

The ostensible basis of the controversy, of course, is the Geneva meeting to complete the setting up of the ITO. Its purpose, as set forth at Bretton Woods, is to police world trade and eliminate cut-throat trade tactics; the keystone of the ITO program is the reciprocal trade agreements nurtured by the State Dept.

However, the dissension is even more deep-rooted. Historically, fixing of tariff schedules has always been the exclusive right of Congress and any move to raise or lower rates has always signaled long-drawn-out debate. In 1934, the Administration persuaded the New Deal Congress to share this cherished privilege with the State Dept., permitting the latter, when it believed it feasible, to reduce, up to 50 pct, the duties imposed on a long list of imports.

Taking its new responsibility seriously, under the leadership of Secretary Hull the State Dept. proceeded to slash rates in varying amounts and on different types of goods. According to the best available figures, tariffs were cut on the average about 31 pct.

While this was accomplished by reducing a little here and much more there, the ratio of duties to the foreign value of imported metals and manufactures was 30 pct in 1939, according to the Tariff Commission. This figure includes only dutiable items and a few others, such as copper, which are subject to import excise taxes.

This action, according to Assistant Secretary Will Clayton, has resulted in a greater boost in American exports than increase in imported foreign goods.

"Between 1935-39," he explains, "our imports from countries with which we did not have trade agreements increased 12½ pct; from those with which we did have, 22 pct. In the same period, our exports to countries with which we had no agreements increased 32 pct; to those with which we did have, 63 pct."

Nevertheless, Congress has been increasingly resentful of having relinquished even part of its jealously guarded powers but hasn't been able to do much about it; the Democratic majority in 1945 was successful in extending the State Dept.'s present authority until June 1948. Now the political complexion of Congress has

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SWITCHERS: *Working in 12 below zero weather, this quartet made a connection from U. S. Steel's natural gas lines to a line feeding Pittsburgh's civilian consumers during the terrific cold snap there early this month. Left to right, Steve Day, Charley and Harry Kearns Kearns and Toy Thomas. A total of 25 million cu ft of natural gas was taken from the U. S. Steel lines before warmer weather ended the emergency.*

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changed, hence the growing move to clip the wings of the State Dept. in regard to tariffs.

Although the GOP is traditionally the high-tariff party, opposition to the proposed tariff dickering is not held strictly to a partisan basis. Some Democratic stalwarts have come out in flat opposition, stating that they are afraid it might open the way to "free trade"; some Republicans are strongly in support of the State Dept. program.

Some members have carried their fight to the State Dept. only to be rebuffed. For instance, Sen. Hugh Butler (R., Neb.) made a personal request that the Department hold off until the "new Republican Congress" could study foreign trade policies which, he declared, comprised a "lame duck" program, repudiated at the 1946 election.

Assistant Secretary Clayton brushed aside the demand with the comment that since the trade agreements act was not a campaign issue, the Department couldn't accept the change in parties as repudiating its policies. In fact, he held, it was a popular program and anyone attempting to wreck the reciprocal trade program would be "tarred with the brush of economic isolationism," which would be a "political liability rather than an asset."

In support of the plea for a world trade organization, it is argued that it is far better to enter into reciprocal agreements for the purpose of regulating foreign trade than to continue on the old basis which permits discriminatory quotas and bi-lateral deals. This, the Department declares, is sure-fire strangulation of business with foreign powers.

Right now, it emphasizes, the United States is a major source of machinery and industrial equipment. But foreign nations can only buy American if they have American dollars or credits. They must either sell their wares in the United States or get an American loan in order to do business with us.

It is pointed out by State Dept. experts that reduced tariffs would cut sales prices on foreign goods here, obviously increasing sales volume; this would mean more dollars or credits in the hands of foreign nations with which to buy machinery and equipment, textiles and other goods, which they need in quantities. Thus, more American goods could enter foreign markets.

THE TOMMIES TAKE OVER: *British army trucks are loaded with coal at an English colliery for delivery to power stations and gas works on Feb. 17 when the army was pressed into service to help relieve Britain's worst crisis since the war.*

This is the very thing that American producers and workers are afraid of. Although some union leaders have been moderate in their disapproval, others have denounced the program in its entirety. Largely, it is true that AFL unions are opposed to tariff cuts while CIO unions favor them. Labor in its opposition argues that the pay of foreign workers generally ranges from a tenth to one-third that of the American laborer; lowering of trade barriers, it is feared, would bring a flood of cheaply-produced foreign-made goods which would not only spread unemployment but lower the living standards for the employed, greatly reduce purchasing power and bring on a depression. Management where it opposed tariff cuts makes similar points.

In refutation, the theory is advanced that when the present backlog of demand has disappeared, the normally high employment industries, such as in the automotive and machinery fields, would find it necessary to curtail production to the levels of domestic demand; tariff concessions must be used to develop new markets abroad in order to take up this slacking off, it is argued.

The reply also has been made that the United States will insist on an escape clause by which it could withdraw agreements if they resulted in injuring American industry. Those opposing the agreements say they do not think the clause would ever be applied.

What Congress actually fears is that the State Dept. would permit itself to be out-traded. A charge was recently made on the floor of the Senate that in more than 1200 actions taken under the Act, only a few, if any, advances in tariffs had been made, that all revisions had been downward.

This is met by the assertion that there is a wide range of basic materials, such as nickel, tungsten and manganese, which are indispensable to industry but which must be imported from abroad; tariff concessions must be made in order to assure their flow to the American market, it is held.

Pig Iron Priorities May Soon Be Replaced By Voluntary Allotments

Washington

• • • **A plan now being studied** which would drop formal governmental certification of pig iron for housing needs after Mar. 31 and substitute a plan for voluntary allocations is expected to be announced shortly by the Office of Temporary Controls.

Such a plan, if adopted, would be along the line of the one worked out recently for the steel industry under which it has agreed to ship the same quantities during the final quarter of 1947 as in the first quarter. (THE IRON AGE, Feb. 20, p. 103).

The joint pig iron industry advisory committee has strongly opposed all allocations. However, at the most recent meeting members indicated that if it were the only alternative, such a plan is more acceptable than continued government certification.

CPA's position is that the government is legislatively committed to a housing program and cannot abandon all allocations programs, voluntary or government-controlled at this time.

Members of the committee told CPA and the office of the Housing Expediter that some foundries receiving certifications for pig iron for housing were using as high as 90 pct pig iron charge in their furnaces as compared with the normal 50-50 charge of pig iron and scrap thus emphasizing the pig iron shortage. Others, they said, make no attempt to obtain materials without priorities.

CPA officials optimistically look for an early opening of the Sheffield Steel Co. blast furnace at Houston, Tex., to improve the situation. It has an estimated capacity of from 7500 to 10,000 tons a month. Its opening is expected in 6 to 8 weeks.

Government Owned Steel Plants

Sold—Leased—Still Surplus—Not Surplus

Sold

Plant	Location	Annual Capacity Steel	Net Tons Pig Iron
Carnegie-Illinois Steel Corp.	Duquesne, Pa.	165,000	....
Carnegie-Illinois Steel Corp.	Homestead, Pa.	1,700,000	....
Carnegie-Illinois Steel Corp.	Braddock, Pa.	....	860,000
Geneva Steel Co.	Geneva, Utah	1,283,400	1,150,000
Inland Steel Co.	E. Chicago, Ill.	85,000	854,000
American Steel & Wire Co.	Duluth, Minn.	....	266,000
Republic Steel Corp.	S. Chicago, Ill.	821,000	450,000
Jones & Laughlin Steel Corp.	Benson Mines for Aliquippa, Pa.	....	72,000
Babcox & Wilcox Co.	Beaver Falls, Pa.	18,000	....
	Total	4,072,400	3,652,000

Leased

Sheffield Steel Co.	Houston, Tex.	186,400	20 yr lease
Granite City Steel Co.	Granite City, Ill.	390,000	5 yr lease
Jessop Steel Co.	Washington, Pa.	25,200	5 yr lease
United Engineering & Foundry Co.	New Castle, Pa.	72,000	3 yr lease
	Total	673,600	

Cannibalized

Andrews Steel Co.	Newport, Ky.	190,000	

Still Surplus

American Rolling Mill Co.	Middletown, Ohio	54,000	....
Columbia Steel Co.	Ironton, Utah	....	300,000
Pittsburgh Steel Co.	Monessen, Pa.	100,000 HM	432,000
Republic Steel Corp.	Cleveland, Ohio	120,000 HM	450,000
Republic Steel Corp.	Youngstown, Ohio	220,000 HM	392,000
Republic Steel Corp.	Gadsden, Ala.	120,000 HM	280,000
Sheffield Steel Co.	Houston, Tex.	....	274,000
Youngstown Steel & Tube Co.	Indiana Harbor, Ind.	120,000	....
Barium Steel Co.	Canton, Ohio	35,000	....
Copperweld Steel Co.	Warren, Ohio	141,840	....
Koppers United Co.	Granite City, Ill.	....	465,000
Lone Star Steel Co.	Daingerfield, Texas	....	438,000*
McCrossin Engineering Co.	Rusk, Texas	(Project Incomplete)	36,000
Pittsburgh Coke & Chemical Co.	Chester, Pa.	....	127,000
	Total	910,840	3,194,000

Not Surplus

Bethlehem Steel Co.	Bethlehem, Pa.	300,000
Crucible Steel Co. of America	Harrison, N. J.	75,000
Republic Steel Co.	Canton, Ohio	318,000
Isaacson Iron Works	Seattle, Wash.	72,000
Midvale Co.	Nicetown, Phila., Pa.	118,000
Pacific States Steel Co.	Niles, Calif.	110,000
Rustless Iron & Steel Co.	Baltimore, Md.	30,000
	Total	1,023,000

HM—Hot Metal.
* This capacity has been revised downward to 399,850.

Westinghouse to Expand Facilities at Buffalo

Pittsburgh

• • • **Plans to expand** manufacturing facilities at the Westinghouse Electric Corp.'s Buffalo plant have been disclosed by T. I. Phillips, vice-president. The new operation, formerly a part of the Switchgear & Control Div. at East Pittsburgh, will be known as the "Industrial Control Div." To facilitate the transfer, L. R. Ludwig, manager of the Motor Div., has been assigned responsibility for this operation in its present location. Operations at Buffalo will eventually include motor, industrial control, copper-wire and welding activities, and will be known as the Buffalo divisions, rather than the Buffalo Motor Div. Mr. Ludwig will be manager of the Buffalo divisions.

An additional 1500 persons will be added to the payrolls at Buffalo when operations are fully under way, bringing employment to 7200 persons, with an annual payroll of $14,500,000. Mr. Ludwig anticipates $10 million worth of production annually from the new division. The moving operation will begin sometime in March.

Seeks Market Contract

Washington

• • • **Housing Expediter** Frank R. Creedon has requested the RFC to negotiate a guaranteed market contract with Fox Metal Products Corp., Denver, for the production in 1947 of the 1550 aluminum houses.

Construction will be the conventional one-story two-bedroom type with 707 sq ft of floor area. Framing will consist of aluminum structural members, while aluminum sheets will form the exterior walls and roof finish.

It is estimated that the complete house, erected but without land, will cost approximately $5100. The houses will be marketed in the Rocky Mountain area.

Canadian Producers Raise Prices, Extras On Galvanized Ware

Toronto

• • • **Canadian prices** on galvanized sheet and extras on galvanized wire and nails have been increased as a result of higher production costs resulting from recent advances in base metal prices, including copper, lead and zinc. On galvanized sheets, base price is advanced 50¢ per 100 lb to $5.05, and the extras on galvanized wire and nails have been marked up 75¢ per 100 lb. On other lines of iron and steel, prices are continued at the ceiling levels which went into effect last April. In the past couple of weeks there has been a lifting or abandonment of price ceilings and controls on many commodities, but so far this has not been carried through to iron and steel and products. It is the opinion in official circles that greater strides will be made toward abandoning price controls at the end of March and, by September, the majority of controls will have been eliminated.

Canadian industry has new problems to contend with, shortage of box cars for movement of freight. This shortage is directly credited to the big movement of grain from western districts which has taken all available cars, leaving few for the handling of other lines of freight. Within the past few days reports have been received from a number of companies, including Chrysler Corp. of Canada, that workers would be laid off because box cars were not available for moving products out of the plants. Some steel producers are also beginning to feel the pinch. Railroad officials claim that it may be six or eight months before new cars are available to relieve the congestion. While reports of curtailment in industrial operations have been forthcoming from a number of sources, so far steel producers in this country have not cut production schedules.

New Extras for Rivets

Cleveland

• • • **The Champion Rivet** Co. has announced a new classification of large rivet extras effective Feb. 15. The new extras apply to rivets of diameters ranging from ½ in. to 1¾ in. and cover American standard heads and American standard rivet shank tolerances and variations therefrom.

AMERICAN IRON AND STEEL INSTITUTE
CAPACITY, PRODUCTION AND SHIPMENTS

Period DECEMBER - 1946

Steel Products	Number of companies	Items	Maximum Annual Potential Capacity Net Tons	Current Month: Production Net Tons	Current Month: Production Per cent of capacity	Current Month: Shipments (Net Tons) Total	Current Month: Shipments (Net Tons) To members of the industry for conversion into further finished products	To Date This Year: Production Net Tons	To Date This Year: Production Per cent of capacity	To Date This Year: Shipments (Net ...s) Total	To Date This Year: Shipments (Net ...s) To members of the industry for conversion into further finished products
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	xxxx	xxxx	xxx	309,336	139,162	xxxx	xxx	*3,595,372	1,645,748
Structural shapes (heavy)	12	2	9,421,550	314,110	41.2	309,570	xxxx	*3,466,193	39.1	*3,479,683	xxxx
Steel piling	4	3		15,215		16,432	xxxx	219,694		205,454	xxxx
Plates (sheared and universal)	29	4	17,080,770	396,498	27.4	394,156	7,954	*4,473,331	26.2	*4,402,890	250,709
Skelp	6	5	xxxx	xxxx	xxx	19,505	10,194	xxxx	xxx	421,699	194,666
Rails—Standard (over 60 lbs.)	4	6	3,657,000	161,684	52.2	162,540	xxxx	1,822,680	49.8	1,799,201	xxxx
—All other	5	7	392,000	12,848	38.7	11,865	xxxx	144,304	36.8	145,425	xxxx
Splice bars and tie plates	13	8	1,745,960	51,070	34.5	53,625	xxxx	619,005	35.5	648,326	xxxx
Track spikes	11	9	349,400	13,053	44.1	14,300	xxxx	140,691	40.3	146,887	xxxx
Hot Rolled Bars—Carbon	34	10	xxxx	620,809	xxx	510,128	50,500	6,961,888	xxx	5,714,850	707,991
—Reinforcing—New billet	16	11	xxxx	81,296	xxx	95,149	xxxx	949,636	xxx	1,055,864	xxxx
—Rerolled	12	12	xxxx	12,601	xxx	11,461	xxxx	143,633	xxx	142,613	xxxx
—Alloy	24	13	xxxx	167,981	xxx	144,727	20,447	1,788,776	xxx	1,528,673	138,395
—Total	41	14	22,326,160	882,687	46.6	761,465	70,947	9,843,933	44.1	8,442,000	846,386
Cold Finished Bars—Carbon	24	15	xxxx	125,987	xxx	126,814	xxxx	1,329,095	xxx	1,319,007	xxxx
—Alloy	23	16	xxxx	21,975	xxx	17,805	xxxx	222,751	xxx	197,962	xxxx
—Total	31	17	2,851,510	147,962	61.2	144,619	xxxx	1,551,846	54.4	1,516,969	xxxx
Tool steel bars	19	18	262,810	8,099	36.4	7,936	xxxx	99,571	37.9	96,391	xxxx
Pipe & Tubes—Butt weld	14	19	2,215,520	107,178	57.1	106,832	xxxx	1,394,541	62.9	1,321,682	xxxx
—Lap weld	9	20	730,200	22,931	37.0	23,966	xxxx	287,098	39.3	305,754	xxxx
—Electric weld	10	21	1,536,900	71,067	54.5	62,161	xxxx	786,373	51.2	675,050	xxxx
—Seamless	13	22	3,169,600	202,171	75.2	178,341	xxxx	2,221,920	70.1	1,954,981	xxxx
—Conduit (cap. & prod. incl. above)	6	23	xxxx	xxxx	xxx	10,052	xxxx	xxxx	xxx	100,969	xxxx
—Mech. tubing (cap. & prod. incl. above)	12	24	xxxx	xxxx	xxx	36,988	xxxx	xxxx	xxx	432,658	xxxx
Wire rods	26	25	7,293,670	411,281	66.5	83,861	25,813	4,465,194	61.2	1,026,504	346,506
Wire—Drawn	41	26	5,742,890	354,948	72.9	206,011	9,168	3,587,558	62.5	2,068,716	135,592
—Nails and staples	19	27	1,259,760	70,967	66.5	75,367	xxxx	634,704	50.4	637,429	xxxx
—Barbed and twisted	16	28	543,010	18,939	41.1	19,679	xxxx	209,646	38.6	207,610	xxxx
—Woven wire fence	16	29	1,121,060	31,892	33.6	32,758	xxxx	378,809	33.8	383,230	xxxx
—Bale ties	13	30	149,700	9,521	75.0	9,610	xxxx	95,680	63.9	99,993	xxxx
Black Plate—Ordinary	9	31	xxxx	xxxx	xxx	92,111	200	xxxx	xxx	784,346	1,663
—Chemically treated	8	32	465,000	13,619	34.6	12,856	xxxx	129,679	27.9	125,170	xxxx
Tin and Terne Plate—Hot dipped	9	33	3,758,850	149,079	46.8	169,024	xxxx	1,810,236	48.2	1,924,657	xxxx
—Electrolytic	9	34	2,231,850	88,354	46.7	95,602	xxxx	892,941	40.0	909,173	xxxx
Sheets—Hot rolled	31	35	19,785,320	1,248,891	74.5	608,090	38,759	13,917,916	70.3	*6,377,831	421,198
—Cold rolled	14	36	7,309,460	498,585	80.5	380,826	xxxx	5,545,584	75.9	4,078,951	xxxx
—Galvanized	16	37	2,924,130	113,280	45.7	130,495	xxxx	1,402,426	48.0	1,463,778	xxxx
Strip—Hot rolled	25	38	7,180,030	241,691	39.7	153,142	18,590	2,512,924	35.0	1,600,988	237,176
—Cold rolled	34	39	3,067,450	120,755	46.4	122,806	xxxx	1,346,429	43.9	1,308,050	xxxx
Wheels (car, rolled steel)	5	40	315,400	25,345	94.8	24,927	xxxx	248,571	78.8	252,656	xxxx
Axles	6	41	398,170	12,546	37.2	12,868	xxxx	134,360	33.7	130,682	xxxx
All other	3	42	169,510	4,223	29.4	485	xxxx	44,674	26.4	6,266	xxxx
TOTAL STEEL PRODUCTS	143	43	xxxx	xxxx	xxx	4,854,207	320,787	xxxx	xxx	53,073,421	4,079,644
Effective steel finishing capacity	143	44	64,648,000	xxxx	xxx	xxxx	xxxx	xxxx	xxx	xxxx	xxxx
Percent of shipments to effective finishing capacity	143	45	xxxx	xxxx	xxx	82.7%	xxxx	xxxx	xxx	76.1%	xxxx

During 1945 the companies included above represented 99.3% of the total output of finished rolled steel products as reported to American Iron and Steel Institute.

U. S. Sues Corp. to Halt Consolidated Purchase; Fairless Denies Charge

Washington

• • • **Declaring that it will** constitute a violation of the Sherman Anti-Trust Law and would eliminate substantial competition in the sale of rolled steel products, the Dept. of Justice on Feb. 24 filed a suit at Wilmington, Del., to enjoin the purchase by the Columbia Steel Co., a U. S. Steel subsidiary of the Consolidated Steel Corp., Los Angeles. It was further charged that the purchase would eliminate substantial competition between U. S. Steel Corp. and its subsidiaries and Consolidated Steel in the manufacture and sale of fabricated products in 11 western and southern states.

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New York

• • • **Benjamin F. Fairless,** president U. S. Steel Corp., has denied the allegation of the Dept. of Justice to the effect that the acquisition of Consolidated Steel Corp. by the steel corporation would constitute a violation of the Sherman Anti-Trust Act. He said:

"The facts will speak for themselves. In the judgment of ourselves and our counsel, this proposed acquisition would not result in a substantial suppression of competition.

"Consolidated is a fabricator of steel. Its principal fabricating operations are at Los Angeles and San Francisco. U. S. Steel now has no fabricating plants on the West Coast of the character of those owned by Consolidated. There is no competition of any substance today between Consolidated and Columbia Steel, or between Consolidated and any other U. S. Steel subsidiary.

"The active competitive situation now existing in the steel fabricating field on the Pacific Coast, with some 47 different concerns engaged in this business, would not be changed in any substantial way by the consummation of this transaction. Columbia Steel would merely take the place of Consolidated.

"Such an acquisition of the assets of Consolidated would not increase the steel making capacity of U. S. steel for the simple reason that Consolidated has no steel making facilities and does not produce steel.

"Last June, U. S. Steel purchased from the Government its large steel mill at Geneva, Utah. This was a war facility, built by the Government to provide plates and structural steel for the Government's huge wartime shipbuilding program on the Pacific Coast. Geneva's capacity to manufacture plates and structural steel is in excess of any likely postwar needs for these products in the Far West. Upon acquiring the Geneva plant, it became U. S. Steel's responsibility to seek means to utilize so far as possible these excessive plate and structural steel capacities, and thus permit the Geneva plant to be continued in operation over the years and serve as a source of supply for Western users of steel. A natural step toward accomplishing this result is for U. S. Steel to engage in the steel fabricating business on the West Coast, an activity which it has carried on for many years in other parts of the country.

"Consolidated informed U. S. Steel some months ago that its fabricating business was for sale. Such a purchase seemed to U. S. Steel to be the logical way to secure an essential outlet for plates and structural steel to be produced at Geneva, and thus help to insure the future operation of the Geneva plant.

"Negotiations with Consolidated for such a purchase were commenced last October. Last December Columbia Steel announced that it had entered into a contract for the purchase of the fabricating assets and business of Consolidated, subject to approval by the stockholders of Consolidated. A meeting of the stockholders of Consolidated was scheduled to be held on March 3, 1947, to act on this matter."

E. G. Plowman Suggests Steps to Meet Critical Freight Car Shortage

Pittsburgh

• • • **Four immediate steps** to meet the critical freight car shortage and avert a rail transportation breakdown were suggested recently by E. G. Plowman, vice-president, traffic, U. S. Steel Corp. of Delaware, in an address at the annual dinner of the Traffic & Transportation Assn. of Pittsburgh.

He attributed the rail transportation plight to a lack of freight car replacements in the war years, and said the rundown condition of cars was one reason that American railroads last year carried 20 pct less ton-miles than in 1944, with only 2 pct more cars.

Mr. Plowman suggested the following four point program to avert a possible rail crisis: (1) Continue heavy loading of cars. Loading to approximate wartime levels will achieve the equivalent of a 10 pct increase in the number of cars and will require the continuance of ODT heavy loading orders. (2) Continue to apply Interstate Commerce Commission orders penalizing misuse of cars. Penalty demurrage speeds car movements and often forces shippers to go into overtime unloading, thus offsetting, to some extent, the adverse effect of the 5-day week on car movements. Limited embargoes, by temporarily diverting shipments from overloaded to more open channels and from one time period to another, alleviate the car shortage by making maximum use of existing facilities. The diversion of short-hauls to trucks is another effective use of the limited embargo. (3) Continue and improve the efficient car distribution system developed during World War II. Add to present car distribution rules provisions which would maintain on each railroad more nearly the equivalent of its ownership of each class of cars and also require keeping off-line cars in good repair. (4) Step up voluntary cooperation of shippers. Substituting different types of cars and different forms of transportation where possible are ways in which shippers can speed up car movements. Maximum use of trucks and barges must be made as they become increasingly available. Cleaning and making minor repairs on unloaded cars are other ways in which shippers can expedite car movements.

Mr. Plowman cited the increasing rate of freight car production, the pickup in truck manufacture and public recognition of the seriousness of the car shortage as factors affecting the rail transportation picture favorably.

Weekly Gallup Polls . . .

Public Believes Eisenhower and MacArthur Will Not Run

Princeton, N. J.

• • • **Two names which** crop up persistently whenever or wherever 1948 presidential politics are discussed are those of the two famed military leaders—Gen. Dwight D. Eisenhower and Gen. Douglas MacArthur.

Both of these men rank high in public esteem, but both have made statements which may be regarded as disavowals of political ambitions.

A nationwide survey of the voting public finds a majority of voters believing that neither of the two great military figures will become a candidate in 1948, according to George Gallup, director, American Institute of Public Opinion.

The questions:

(1) "Do you think Gen. Dwight Eisenhower will become a candidate for president in 1948?"

The replies:

	Pct
Yes	21
No	61
No Opinion	18

(2) "Do you think Gen. Douglas MacArthur will become a candidate for president in 1948?"

The replies:

	Pct
Yes	12
No	71
No Opinion	17

Although Philip Murray waved a genial hand in General Eisenhower's direction at the CIO convention in Atlantic City a couple of months ago, and one story was printed saying Eisenhower was willing, "Ike" denied ever making any such statements. "It's a lie . . . I never said anything of the kind . . . a man with no party affiliation could not even discuss running for President of the United States."

General MacArthur had this to say when asked if he had presidential ambitions: "None whatsoever. I have never entered politics and never intend to do so. I have stated before and I reiterate now that I started as a soldier and shall finish as one. I am on my last public assignment which, when concluded, will mark the definite end of my service."

An interesting sidelight: There is fairly conclusive public feeling among those with opinions that MacArthur, if he were to run, would have his name on the Republican side of the ledger.

When it comes to Eisenhower, the people who express an opinion divide 50-50—one-half say he would run on the Democratic ticket, the other half say he would run on the Republican ticket.

These facts are shown in response to the questions:

(1) "If Eisenhower does become a candidate, which ticket do you think he will run on—the Democratic or Republican?"

	Pct
Democratic	29
Republican	29
Undecided	42

(2) "If MacArthur does become a candidate, which ticket do you think he will run on—the Democratic or Republican?"

	Pct
Democratic	18
Republican	46
Undecided	36

•

• • • **No matter how** the Georgia battle for the governorship may finally turn out, Herman Talmadge has not done so well in his first brush with public opinion throughout the nation.

That goes for opinion in the South, as well as throughout the entire nation.

But the show he has staged in Georgia in recent weeks has certainly drawn a phenomenally large audience—84 out of every 100 persons questioned by the institute across the nation in recent days say they have heard or read about the affair.

When voters who have followed the Georgia battle are asked what they think about it, the majority of them express disapproval, many of them in strong terms—"shameful . . . a disgrace . . . a farce."

South and Nation as a Whole Inclined to Favor Thompson In Georgia's 'Battle of Governors'

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When the same voters are asked which man they think should serve instead of the late Eugene Talmadge as governor of Georgia, opinion throughout U. S. among those with opinions is, rightly or wrongly, four to one in favor of M. E. Thompson. Opinion in the South is two and one-half to one in favor of Thompson. This is among those with opinions. Four out of ten—a high proportion—have no opinion to offer to the question.

Thompson, elected lieutenant-governor when Eugene Talmadge was elected governor, would have been successor to "Gene" had the elder Talmadge lived long enough to be sworn in to office.

Here are the questions and replies asked by the institute of voters across the nation in connection with the Talmadge affair:

(1) "Have you heard or read about the fight in Georgia over who is to be governor?"

	Entire Nation Pct
Yes	84
No	16

(2) "What is your opinion about this fight?"

	Pct
Bad, shameful, disgraceful, etc.	38
Talmadge is wrong	11
Calls for another election	4
Laws should be passed to take care of succession	4
Undemocratic	3
Talmadge should wait for court decision	2
Talmadge is right	2
Miscellaneous replies	8
No opinion or paid no attention	28

(3) "Who do you think should be governor of Georgia—Herman Talmadge or M. E. Thompson?"

National Opinion

	Pct
Favor Talmadge	11
Favor Thompson	49
No Opinion	40

Steel Firms Revise Plate Extras and Clarify Definitions

New System Reclassifies Some Items So That Flat-Rolled Confusion is Lessened

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By D. I. BROWN
Chicago Regional Editor

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Chicago

• • • **Concurrent with the** latest revision in plate extras, the steel industry has now answered the $64 question—When is a flat-rolled product a sheet, a plate, a bar, etc.? The current changes are minor when compared to the practice used from 1933 to Dec. 4, 1946. During the war the industry had proposed to OPA a modified form of classification which was never adopted. With the demise of OPA some mills put this recommended system into effect and its use caused some consternation and differences of opinion between producers and consumers.

This system specified that anything over 6 in. wide, 0.2030 in. and under in thickness was a sheet, and 0.2031 in. and heavier was a plate. Having found that too many inconsistencies developed from this system, the mills have revised the classifications. The table shown here is the Carnegie-Illinois Steel Corp. version, and other mills report that the system compares favorably with what they had planned. It has been learned that other producers will, therefore, adopt this classification.

The new system reclassifies some products so that what used to be a sheet is now a plate, but producers report that the tonnage so affected is small. One mill in the Chicago area has estimated that about 1 pct of their total flat-rolled tonnage falls in this category. Another mill has reported that the tonnage so affected is closer to 2 pct but that each and every mill will vary because of the product mix of individual plants. Consumers who only had sheet quotas with the mills may now find that their requirement falls in the plate category.

The mills have foreseen such possibilities and are in the process of revising their allocations so that the new rules will not alter the established customer quotas in the amount of a product a consumer is permitted to order. Consumers report they aren't fearful of losing their sources of supply but they say that in some cases the price changes abruptly, because of product classification, and that their cost figures are in a state of flux.

Of the size ranges heretofore classified as sheets or strip, the following sizes are now termed plate:

Width	Thickness
Over 6 in. to 12 in.	.2499 in. to .230 in. strip
Over 12 in. to 48 in. inclusive.	.2499 in. to .230 in. sheet
Over 48 in.	.1874 in. to .180 in. sheet

Customers are being asked to order plates in fractions of an inch, or weight per sq. ft. rather than in decimals. The minimum acceptable limits are:

Width	Weight per Sq. Ft.	Fraction of an Inch
Over 6 in. to 48 in.	9.62 lb	1/4 in.
Over 48 in.	7.53 lb	3/16 in.

The new extras and latest revisions regarding plates, consumers say, mean that their ordering procedure will have to be tightened if they are to escape being charged extras not formerly in effect. In fact, the classification extras plainly imply that the only plates which can be ordered as base, and therefore free of quality extras, is a product in which they cannot specify chemistry, mechanical properties or any restrictions as to method of manufacture. Name grades which consumers are no longer permitted to specify include: Extra dead soft openhearth, dead soft openhearth, stock steel, medium steel and tank steel. If consumers want any of the restrictions formerly available for these grades, they will have to pay appropriate extras or just specify carbon steel plates and hope this extra-free grade will do the job.

As a simple illustration, one large consumer cited the following example in quality extras: On the old system this plant specified dead soft openhearth steel wherein the carbon was specified 0.14 max, and for which there was no extra. Under the new

FLAT ROLLED CARBON STEEL
(excluding Semi-Finished products)

SIZE CLASSIFICATION
Effective Feb. 17, 1947

THICKNESS—inches

WIDTH (Inches)	.2500 and Thicker	.2499 to .2300	.2299 to .2031	.2030 to .1875	.1874 to .1800	.1799 to .0568	.0567 to .0344	.0343 to .0255	.0254 to .0142	.0141 and Thinner
3½ and under	Bar	Bar 2	Bar 2	Strip 1	Strip 1	Strip 1	Strip 1	Strip 1	Sheet 2	Sheet 2
Over 3½ to 6	Bar	Bar 2	Bar 2	Strip 1	Strip 1	Strip 1	Strip 1	Sheet 2	Sheet 2	Sheet 2
Over 6 to 12	Plate 1 and 6	Plate 1	Strip 1	Strip 1	Strip 1	Strip 1	Sheet 2	Sheet 2	Sheet 2	Sheet 2
Over 12 to 24 excl.	Plate 3 and 5	Plate 3	Sheet 3	Sheet 3	Sheet 3	Sheet 3	Sheet 3	Sheet 3	Sheet 3	Black Plate 3
24 to 32	Plate 4	Plate 4	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet	Black Plate
Over 32 to 48	Plate 4	Plate 4	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet
Over 48	Plate 4	Plate 4	Plate 4	Plate 4	Plate 4	Sheet	Sheet	Sheet	Sheet	Sheet

[1] If Spring or Bumper Steel Special Sections, including Parabolic Sections, classify as Bars.
[2] If Cold Rolled, classify as Strip.
[3] If C. R. Special Edge or Finish, or Temper as in ASTM Spec. A-109, classify as Strip.
[4] If Cold Rolled, classify as Sheet.
[5] If C. R. not with Special Edge, Finish or Temper, classify as Sheet.
[6] If Cold Rolled, classify as Bar.

setup the same specification must be written, openhearth carbon plate 0.14 carbon max, and the producer will charge $2 a ton for specifying chemistry and $2 more for specifying the carbon at 0.14 max.

Some consumers say their application prevents ordering the plates in any other manner. Still other consumers are attempting to decide if a higher carbon is permissible for their application, such as 0.15 or 0.30 carbon, in openhearth where there is no extra unless the manganese exceeds 0.60 or minimum phosphorus and sulfur specifications are necessary. If they can't do this they must order coarse or fine grain steel.

The users of plates who are beginning right in the front of the new price book and studying each page, are discovering that the business of ordering plate is a highly complex procedure and that practically every possible contingency is adequately classified and chargeable on some kind of an extra. Regarding thickness extras, weight specifications per sq ft under 15.3 lb per sq ft have been added and will be charged. Under length extras the original change has been modified and tightened in the Feb. 17 revision.

By the first ruling, a customer could order sheared plates up to and including 1½ in. in thickness free of length extras, now the extra applies on all thicknesses whether sheared or gas cut. In the gas cutting extras the mills have relaxed the maximum carbon content up to 0.39, instead of 0.35 carbon, but state it is imperative to stress relieve or soften after flame cutting all plates containing over 0.39 carbon no matter who assumes the responsibility of possible thermal cracking. Stress relieving now costs $1 a ton on qualities lower than locomotive firebox with no extra on locomotive firebox or higher quality.

In general the new extras are of major significance just as they have been in other products. In plates it is no longer permissible to specify openhearth or bessemer and consumers report that the mills request that all specifications be placed on either a chemical or physical requirement with no reference to type of melting. If a customer wants both chemistry and property restrictions the extra is $4 a ton. The classification extras now in effect for plain plates do not apply to floor plates, but producers have informed the trade that high strength steels are subject to the appropriate extras of the carbon list.

The specified grain size quality extra shown in the new price book as $17 a net ton applies only when a range of grain size numbers is specified. Consumers have been informed that if they specify only fine or coarse grained plates the extra will be but $10. Chemical requirement extras for manganese content have been clarified by the latest revision. The range from 0.35 to 0.60 inclusive remains "base" and 0.61 to 0.90 inclusive cost $2 a ton. However, one mill has ruled that when a manganese maximum limit only is specified and that limit does not exceed 0.80 manganese, the extra for a specified maximum manganese in the range of 0.61 to 0.90 will not be charged, providing the other requirements specified or implied do not demand the use of higher than a normal manganese content.

Major difficulties still evolve primarily around supply and demand, and experienced observers state that the present prices can only hold as long as the unprecedented demand continues. It would appear, therefore, that despite present high prices and complicated extras, these features are not the largest thorn in the side of steel consumers.

Texas Nail Plant Signs A New USWA Contract With No Wage Increase

Evanston, Ill.

• • • **One of the first** new contracts between a steel fabricator and the United Steelworkers of America has been signed in Galveston, Tex. A spokesman for the Dickson Weatherproof Nail Co., whose main plant is located here, disclosed that the new contract covering its Galveston factory contains no wage increase.

The only change in the new contract is inclusion of a clause protecting Dickson workers from loss of overtime pay during those weeks in which holidays occur. The company added this provision voluntarily after the new contract had been successfully negotiated with no change in its provisions.

It was recalled by those familiar with the company's history that in February 1946 the USWA signed with the Galveston factory at no wage advance while the nation's steel mills were strikebound. Subsequently, it is understood, the Dickson Galveston plant voluntarily granted an 18½¢ boost last May.

ON THEIR WAY: *With noneconomic discussions giving way this week to initial wage talks, Philip Murray, USWA head (left) and Jack Stephens, chief Steel Corp. wage negotiator, will get down to brass tacks on the question of how far up the corporation will go on a wage increase and how far down the union will come.*

CPA Trims OIT's Tinplate Allocation Request to 55,000 Tons

Washington

• • • An Office of International Trade request for an allocation of 140,000 tons of tinplate for export during the second quarter, in addition to the 65,000 tons already authorized (THE IRON AGE, Jan. 30, p. 104) has been cut down by CPA to 55,000 tons—making a total of 120,000 tons for the second quarter. The CPA action has been approved by Presidential Adviser John R. Steelman.

CPA, taking the position that the 65,000 tons approved several weeks ago is part of the second quarter program, since practically all of it is scheduled for April and May rolling, emphatically stated that the request for an additional 140,000 tons which would have resulted in a total of 205,000 tons was excessive.

Accordingly, CPA's Bureau of International Supply approved a second quarter allotment of 120,000 tons as representing the maximum amount which can be provided without very serious effects on the domestic canning program. CPA also believes that this quantity should practically satisfy the most essential needs abroad, and, at least, prevent the actual loss of perishable foods.

This compares with an estimated total of 124,162 tons of tinplate to be delivered for export during the first quarter of this year, including the 55,000 ton advance allotment and the fourth quarter 1946 carryover of 69,162 tons.

The fulfillment of the foreign requirements is made considerably more difficult by the fact that other countries are unable to use electrolytic tinplate and can only use hot-dipped. CPA says that the hot-dipped production capacity of this country is only 153,430 tons per month, and if the full OIT request were seriously considered it would take up 44 pct of the total capacity.

The entire second quarter allocation will not be covered by CXS ratings. Of the 120,000 tons, about 105,000 tons will be used for food preservation abroad and this tonnage will be supported by ratings and directives establishing space reservations during May and June. The remaining 15,000 tons is to be used for petroleum cans and will not be supported by ratings or directives.

But, here again, there is a hitch, since CPA's powers expire on Mar. 31, unless Congress extends them as has been requested by the President. In regard to tinplate, however, Mr. Steelman has directed OIT and CPA to proceed on the assumption that the President's request will be granted. Until Congress renews this authority, the licenses issued by OIT would bear no CXS rating.

Figures showing actual exports during 1946 and licenses granted thus far in 1947 were also revealed to THE IRON AGE for the first time. These accompanying tabulations show that U. S. tinplate has been spread throughout the world under the government-

Government Agencies Disagree On Licensing of Exports In Second Quarter

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By GENE HARDY
Washington Bureau

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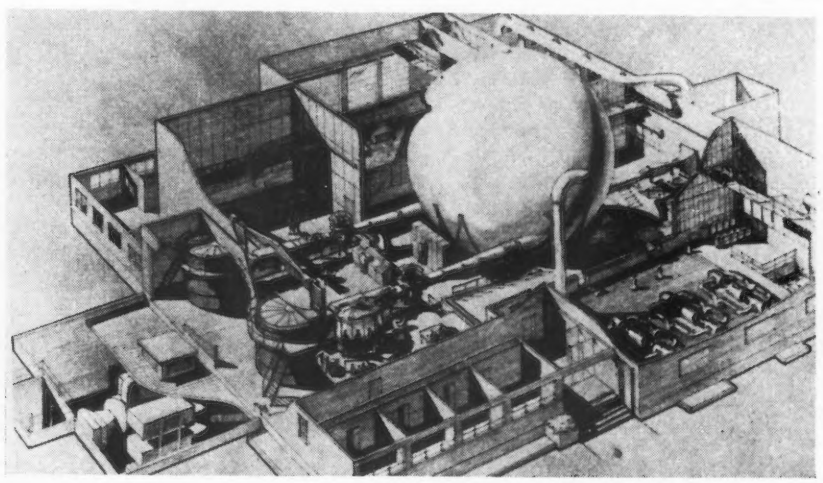

BIG WIND: *Cutaway view of one of the 50 buildings to be erected in the Navy's new $15 million ordnance laboratory, now under construction at White Oak, Md. This is an artist's drawing of the supersonic wind tunnel which was captured intact by U. S. forces in Kochel, Germany, disassembled and shipped here.*

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RESEARCH REWARDED: *Dr. Vannevar Bush receives the Hoover Medal for 1946 for outstanding public service from Scott Turner, right, of Greenwich, Conn., at the winter meeting of the American Institute of Electrical Engineers at New York. E. L. Moreland, left, executive vice president of Massachusetts Institute of Technology looks on. Dr. Bush, an atomic bomb scientist, is chairman of the new Joint Research and Development Board of the Army and Navy.*

o o o

supported program, with Australia consistently receiving the lion's share.

Allocations during 1946 total 402,839 tons after various reductions and adjustments were made because of the work stoppages of last year. Against this total allocation there were exports of 377,950 tons. CPA points out, however, that there is no very close time-wise correlation between allocations and actual exports from the country. Therefore, W. L. Reno, Director of CPA's Bureau of International Supply, has stated that he does not consider the "slight over-licensing which occurred in the third and fourth quarters as being of real significance."

TINPLATE EXPORTS, 1946-1947

Short Tons

COUNTRY	1946			First Quarter, 1947		Second Quarter, 1947
	Allocations	Licenses Granted	Exports	Allocations	Licenses Granted	Allocation[3]
U. S. S. R.	10,411	250	4,220	.....	.....	.....
Australia	80,294	73,293	54,001	15,000	15,000	8,000
New Zealand	14,078	13,040	11,132	2,000	2,000	.....
Union of South Africa	19,850	23,410	13,215	2,000	2,000	.....
Middle East—Total	2,563	2,161	1,778	.....	400	.....
Saudi-Arabia	.....	.....	23	.....	.....	.....
Syria	.....	.....	295	.....	.....	.....
Palestine and Trans-Jordan	.....	.....	346	.....	.....	.....
Egypt	.....	.....	1,113	.....	.....	.....
Anglo Egyptian Sudan	.....	.....	1	.....	.....	.....
Turkey	2,391	2,488	2,499	.....	501	.....
Philippine Islands	3,750	4,591	2,426	.....	749	.....
French North Africa—Total	10,742	10,278	7,872	.....	700	.....
Algeria	.....	.....	1,603	.....	.....	.....
Morocco	.....	.....	5,822	.....	.....	.....
Tunisia	.....	.....	447	.....	.....	.....
France	11,188	7,471	13,966	.....	.....	.....
Belgium	20,181	22,223	17,306	2,200	2,200	5,800
Netherlands	29,820	28,399	27,136	2,200	2,200	11,800
Denmark	6,000	6,428	3,593	.....	700	.....
Norway	13,500	13,459	7,993	2,100	2,100	3,900
Sweden	12,803	13,536	9,226	1,500	1,500	2,000
Italy	12,000	10,500	9,722	.....	500	.....
China	5,196	6,743	3,289	.....	1,400	.....
Hong Kong	.....	.....	772	.....	150	.....
Portugal and Spain	6,500	6,517	7,048	.....	546	.....
Switzerland	2,972	3,891	4,268	.....	571	.....
Finland	100	310	62	.....	100	.....
Newfoundland	.....	399	344	.....	50	.....
Madagascar	.....	1,051	602	.....	600	.....
Eire	.....	438	190	.....	100	.....
Greece	1,000	1,919	1,688	.....	445	.....
New Caledonia	.....	100	.....	.....	30	.....
Latin America	117,975	135,690	118,843	18,000	18,602	14,000
Meat Pack (Latin America)	.....	.....	.....	5,700	.....	2,900
Petroleum Companies	.....	.....	.....	.....	.....	6,000
Other Countries—Total	10,169	1,026	3,772	4,300[2]	1,900	10,600
Greenland	.....	.....	3	.....	.....	.....
Jamaica	.....	.....	342	.....	.....	.....
Surinam	.....	.....	14	.....	.....	.....
India	.....	61	38	1,200	1,200	.....
Portuguese Asia	.....	.....	68	.....	.....	.....
Southern Rhodesia	.....	389	65	.....	.....	.....
French Pacific Islands	.....	.....	.....	.....	.....	.....
Other Portuguese Africa	.....	.....	35	.....	50	.....
Czechoslovakia	.....	.....	1,252	.....	.....	.....
Yugoslavia	.....	.....	1,891	.....	.....	.....
Other	.....	576	64	.....	400	.....
Malaya	.....	.....	.....	.....	.....	.....
Netherlands East Indies	.....	.....	.....	.....	250	.....
UNRRA	9,356	8,435	.....	.....	.....	.....
Total—All Countries except Canada	.....	.....	326,963	.....	.....	.....
Canada	.....	.....	50,987	.....	.....	.....
TOTAL	402,839	398,046	377,950	55,000[1]	55,044	120,000[3]

[1] Not including an additional 65,000 tons allocated for first quarter by PPD-150 for April and May rolling, which is shown in the column headed "2nd Qtr. 1947: Allocation."
[2] 3100 tons not specified by country.
[3] Break down by country is for original 65,000-ton allocation only.

Ordnance and Industry Hold Conference On Development in Gages

Bethlehem

• • • **Army Ordnance** and industry are seeking to continue the wartime cooperation between them on gage standards so that any future need for rearmament may be facilitated. The first step toward this objective was taken by an industry-ordnance gage conference last week at Lehigh University. The conference was sponsored by the Gage Div. of the Army Ordnance Assn. in cooperation with Lehigh University. The meeting was the first of a series designed to establish a national forum on progress in gage development and its application to the national defense.

One of the highlights of the conference was an inspection tour of the Lehigh-Ordnance Gage Laboratory and its exhibits.

A. H. d'Arcambal, Pratt & Whitney, Hartford, sketched the progress in the application of the newer and harder materials to gage production from the days of carbon steel without heat treatment to today's use of high speed steel, tungsten carbide, Norbide, and synthetic sapphire. In his talk Mr. d'Arcambal presented tables showing Knoop and Rockwell hardnesses, toughnesses and tensile strengths of all the materials which have been used or considered for use in gaging practice.

Louis Polk, the Sheffield Corp., Dayton, described gages for national defense and illustrated his talk by slides showing many types of Sheffield gaging equipment.

E. J. Bryant, Greenfield Tap and Die Corp., Greenfield, Mass., discussed methods engineering and gage usage.

Research and development procedures for new weapons by Army Ordnance was the subject of the address at the reactivation dinner meeting by Brig. Gen. Henry B. Sayler, chief of research and development, Ordnance Dept., U. S. Army. James L. Walsh, president of the Army Ordnance Assn., presided and graphically depicted the vast differences in peacetime ordnance expenditures when plenty of time for arming is available but money is short, and in wartime when there is no time but all the money required is available.

Another series of addresses was designed to evaluate the services of the university ordnance gage laboratory to Army Ordnance and to industry. Prof. Orlan W. Boston, Dept. of Metal Processing, University of Michigan, discussed the place of the university ordnance gage laboratory in the university curriculum. Brig. Gen. E. E. MacMorland, commanding general, Frankford Arsenal, described the services of the university ordnance gage laboratory to ordnance. The services of university ordnance gage laboratory to industry were discussed by Prof. Roger L. Geer, Dept. of Metal Processing, Cornell University.

High speed gaging in mass production was described by George E. Miller, Jr., chief, Small Arms Ammunition Div., Frankford Arsenal.

Coming Events

Mar. 2-5 American Society of Mechanical Engineers, spring meeting. Tulsa, Okla.
Mar. 6-8 National Assn. of Foremen, annual national conference of educational directors in industry, Cleveland.
Mar. 17 American Institute of Mining & Metallurgical Engineers, world conference on mineral resources, New York.
Mar. 17-19 American Society of Lubrication Engineers, annual meeting. Pittsburgh.
Mar. 17-19 American Gas Assn., sales conference, Boston.
Mar. 17-19 Chicago Technical Societies Council, production conference. Chicago.
Mar. 19-22 American Society of Tool Engineers, annual meeting, Houston.
Mar. 19-22 National Screw Machine Products Assn., annual meeting, Cleveland.
Mar. 22-27 Western Metal Conference and Exposition, American Society for Metals, Oakland, Calif.
Mar. 24-25 American Machine Tool Distributors' Assn., spring meeting. Chicago.
Mar. 31-Apr. 2 Midwest Power Conference, Chicago.
Apr. 7 Packaging Machinery Manufacturers Institute, semiannual meeting, Philadelphia.
Apr. 7-10 National Assn. of Corrosion Engineers, convention, Chicago.
Apr. 8-11 American Management Assn., packaging exposition, Philadelphia.
Apr. 14-16 National Machine Tool Builders' Assn., spring meeting, Atlantic City, N. J.
Apr. 14-17 Southern Machinery & Metals Exposition, Atlanta.
Apr. 28-29 American Zinc Institute, annual meeting, St. Louis.
Apr. 28-May 1 American Foundrymen's Assn., convention, Detroit.
Apr. 29-May 1 Industrial Packaging and Materials Handling Exposition. Industrial Packaging Engineers Assn. of America, Chicago.
May 6-10 Society of the Plastics Industry, Inc., exposition, Chicago.
May 15-17 Society for Experimental Stress Analysis, annual meeting. Chicago.
May 27 Metal Powder Assn., spring meeting, New York.
June 9-11 American Coke & Chemical Institute, annual meeting, French Lick, Ind.
June 16-20 American Society for Testing Materials, annual meeting. Atlantic City, N. J.
June 17-19 Machinery Dealers National Assn., convention. Cincinnati.
June 23-27 American Electro Platers Society, industrial finishing show, Detroit.

To Make Steel Cabinets

Cleveland

• • • **Republic Steel** Corp. has announced that production of steel kitchen cabinets at Berger Mfg. Div. No. 2 plant, Canton, Ohio, where an extensive reconversion program has been virtually completed, is underway although not yet on a full capacity basis.

R. W. Helms, general manager of sales for Berger, said the plant will produce the entire line of Berger steel cabinets which have been redesigned with many new features. Because of the shortage of steel, present employment at the plant is only 50 pct of the anticipated maximum.

The London ECONOMIST

The Atom — Top Secret

AT THE hearing of the Joint Congressional Committee on Atomic Energy on Feb. 4, Senator McKellar unwittingly committed a major public service. He goaded David Lilienthal into a statement of democratic beliefs whose succinct clarity silenced the crowded room and then bunched reporters around the stenographic transcript clerk.

Consideration of Mr. Lilienthal's nomination as chairman of the new civilian Atomic Energy Commission had been completed except for the attack periodically delivered by the patronage-hungry senior Tennessee Senator whenever the former head of the Tennessee Valley Authority appears for appointment. After about an hour of malicious questions, the senator said: "The truth is that your sympathies are very leftish, are they not?" Mr. Lilienthal then outlined his faith in democracy as an affirmative, rather than a negative, doctrine, a satisfying and positive alternative to communism, in such moving and effective terms that one sympathetic member of the inquisition, Senator McMahon, broke the respectful hush with congratulations "to a very real American."

The immediate results of Senator McKellar's persistence are thus so negative as to have been positive, but they have not rooted out the obstinate suspicion, voiced again this week by Senator Bridges, that Mr. Lilienthal is sympathetic to Russia and therefore peculiarly unsuited to be the guardian of the atomic secret. It is even less certain that those military circles who supported the defeated May-Johnson Bill for the control of atomic energy will not reassert their influence—it is possible to infer that many of the questions asked at the hearings had their ultimate origin in this group.

The test will come, not over the appointment of the commission members, but over the appointment of Carroll Wilson as the commission's general manager and Herbert Marks as its general counsel.

Because of these hearings, the commission has recently had to do 2 days' work each day, one in the capitol and one in its uncarpeted offices in the new War Dept. building, where it is said to start each day by rereading the declaration of policy in the first section of the Atomic Energy Act of 1945, with special attention to one phrase contained therein: "Subject at all times to the paramount objective of assuring the common defense and security."

The responsibilities assigned to the commission in the act are monumental without the complications that spring from the language of the law just quoted. They seem overwhelming as the implications of this overriding paramountcy are understood.

A PROBLEM faced by the commission even before the keys were formally turned over to it at a homely ceremony in President Truman's study on Dec. 30, 1946, illustrates the point.

One of the big plants built and operated by the Manhattan district employed processes that had been demonstrated to be obsolete. There was no intelligent alternative to shutting it down and dismantling it. This action appeared simple enough until members of the commission thought of the information that would be given an interested world by the shutdown.

It would be tantamount to announcing, first, that the process being abandoned was inefficient and could be disregarded, and, second, that other processes had been improved to a point where discarding of the inefficient process could not be further postponed. These disclosures, furthermore, would come during the course of delicate international negotiations, and might be expected to raise a question whether the technical bases of the negotiations had become obsolete.

The commission shut down the plant, and a simple, undetailed announcement was made of that fact. But no member of the commission believes that any precedent was set or any policy formed by the manner in which this first problem was handled.

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

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The incident, to the contrary, convinced members of the commission that they will have to move very slowly and with great caution on all matters of policy. Mr. Lilienthal, the chairman, and his colleagues emphasize that, so far, they have been desperately busy studying the law under which the commission must operate, and the large, scattered and diverse institution they have inherited from the U. S. Army.

IF THE commission has as yet no policy other than that prescribed by law, its members do have thoughts about the general directions in which they should steer. A first thought is that a great deal more push should be put behind the production and distribution of radioactive materials for use in scientific investigations both in the United States and abroad.

An excellent, though modest, start was made in this direction while the Army continued in control. Dr. Eugene Paul Wigner directs the work at Oak Ridge, Tenn., and shipments are being made daily. By arranging for comparable work from the atomic furnaces at Chicago and Hanford, Ore., exceedingly valuable research tools can be more plentiful and better distributed.

Mr. Lilienthal (and he is strongly supported in this by all members of the commission) is deeply convinced that exclusive emphasis on the atomic bomb during the months since Hiroshima has been harmful. He is determined to shift emphasis to the constructive potentialities of self-sustained release of nuclear energies.

Though no physicist, Mr. Lilienthal learned a great deal about the

(CONTINUED ON PAGE 130)

Committee Settles Question of French Imports for 1947

Paris

• • • **The French inter-ministry** committee has settled the difficult question of determining the extent of French imports for 1947 and how they are to be distributed. The first half of the year is to see imports totaling $1029 million, of which $498 million will be used by industries under the authority of the Ministry of Industrial Production. Coal imports will require $80.5 million, ores $43.2 million, building material $4.2 million, needs of the iron and steel industry $83 million.

According to the Monnet plan (see THE IRON AGE, Jan. 30, 1947, p. 114, and Nov. 21, 1946, p. 119), imports requirements for the whole year 1947 have been estimated at 19.8 million tons of coal, 550,000 tons of steel products, 154,000 tons of copper, 44,000 tons of lead, 33,000 tons of zinc ores, and 13,200 tons of tin. There is an estimate of a maximum of 7.7 million tons of domestic steel production, or a possible minimum of 6.6 million tons. Production of cast iron may vary between 1,320,000 tons and 1,100,000 tons, according to the plan, making the total availability of domestically produced iron and steel products between 7,590,000 tons and 6,490,000 tons. The import figure of 550,000 tons is an optimum, the actual will probably be between that figure and 330,000 tons. This production has been allocated as indicated in the accompanying table.

For 1946 the total tonnage of iron and steel available for allocation was 4,504,500 tons, of which 4,180,000 tons came from domestic production, and 418,000 tons from imports, with a total of 93,500 tons exported. The distribution for the past year was as follows (thousands of net tons):

Power industries	977.9
Transport and communications	1,372.8
Agriculture	392.7
Reconstruction	346.5
National defense	262.9
Colonies	322.3
Other consuming industries	1,575.2
Total consumption	5,250.3
Stocks	354.2

Estimates Imports of Steel Items at 550,000 Tons, Coal at 19.8 Million

o o o

Although the above statistics indicate that the total availability for 1947 will represent an increase over the previous year by 1.4 million to 2.7 million tons, demand will still far outstrip production. Due to the reduced coal deliveries during January, the prospects of reaching the maximum objective of 7.7 million tons are remote.

In a recent conference held here, it has been disclosed that the various stages of the steel expansion program as outlined previously are now expected to be realized as follows: 1929 production level of 11 million tons to be equaled in 1950; 13.2 million ton level in 1952; 16.5 million tons at an unspecified later date.

The cost of financing the nationwide modernization programs for steel is estimated at $1 billion, or roughly half the value of existing mills. French technicians estimate the life of a steelworks at 20 years, so if the program were completed in 10 years it would only represent the normal technological development of the industry. If completed in 5 years, it would represent half normal renewal and half special development.

Regular allowances for amortization will provide 50 pct of the cost of the developments, while it is proposed to increase the price of steel products to raise the additional amount. It is estimated that an increase of $12.87 per ton will make up the required amount. This special amortization included in the selling price would be turned over to a common fund, from which it would be disbursed as required.

The implications of the Monnet plan of concentration for the steel industry from the social and business standpoints have raised a series of problems which are just now being approached by French officials. The work which has already been accomplished for the concentration of production at the works of Denain and Anzin and the Steelworks Co. of the North and East will need to be duplicated in many other areas before the plan can be carried out.

Although most French sources have received the Monnet plan favorably, some serious criticism has been voiced recently. There are some sources which feel that France must delay its broad modernization program for a few years until sufficient consumer goods are in the market to restrict inflation and kill the black markets. There is no question regarding the main thesis of the Monnet plan, which states that French industry must modernize in order to survive, but only a question of when this program can be carried out.

The greatest flaw in the plan at the moment is that it assumes as a starting point adequate fuel supplies for existing French industries, an ideal situation which does not exist at present.

In the meantime the parliamentary committee for industrial

Estimated distribution of allocations in 1947

(In thousands of net tons)

			Maximum	*Minimum*
Power industries (coal mines, electricity)			1,298	1,243
Transports and communications			1,441	1,155
Industries			3,272	2,662
Iron ores, mines and steel industry	495	429		
Machine tools	137	121		
Farm equipment	412	330		
Automotive industry	715	577		
Engineering	990	791		
Chemical industries	154	110		
Leather and textiles	132	99		
Building and civil engineering			638	528
Agriculture			396	264
Civil services, schools, hospitals, commerce			423	352
Colonies			528	440
Exports (direct exports of steel products)			176	176
TOTAL			8,172	6,820
Direct and indirect export total from above industries			880	880

production in France has decided to pursue the study of nationalization of the French iron and steel industry. The conservative MRP party voted against the combined Socialist and Communist parties on the measure. M. Michel, Communist, will prepare the report on the program.

Steel Industry Buys Over Half Government-Financed Steel Plants

New York

• • • **Close to 60 pct of the steelmaking facilities which were financed by government funds between 1940 and 1944 had been purchased by steel companies up to the start of this year. More than half of ironmaking facilities had also been sold to members of the iron and steel industry, according to an analysis of government data by the American Iron & Steel Institute.**

The bulk of the purchases of iron and steelmaking facilities from the War Assets Administration took place during the last 7 months of 1946. The facilities purchased by the steel industry thus far not only include steel and ironmaking furnaces, but also rolling mills, coke ovens, sintering plants and other auxiliary equipment. Purchases were made on competitive bids.

Official figures reveal that almost 59 pct of the 6,770,040-ton government-financed openhearth and electric furnace facilities had been purchased by the steel industry, another 9.9 pct had been leased and 2.8 pct of government facilities were dismantled for other use. Up to the end of 1946, about 53 pct of the 6,843,000-ton government-owned blast furnace capacity had been sold to private industry, and the balance was still listed as "war surplus."

At the end of 1946, about 13 pct of government-owned steelmaking facilities had been declared surplus, but were awaiting sale. Another 15 pct had not yet been declared surplus. The steel industry financed construction of 8,384,000 tons of steelmaking capacity between 1940 and 1944 and has since purchased, leased or otherwise used an additional 4,836,000 tons. The total 13,220,000 tons of war created capacity being utilized amounts to about 87 pct of the overall total of 15,154,100 tons of capacity built during the war.

The acquisition of 3,649,000 tons of government-owned ironmaking facilities by the iron and steel industry means that 12,109,000 tons of war-built ironmaking capacity is now being utilized, or 79 pct out of the overall total of 15,303,000 tons. Over 55 pct of war-built ironmaking facilities were privately financed, with the balance being undertaken by the Federal Government.

Steady Labor Front And Higher Output Seen By Canadian Association

Toronto

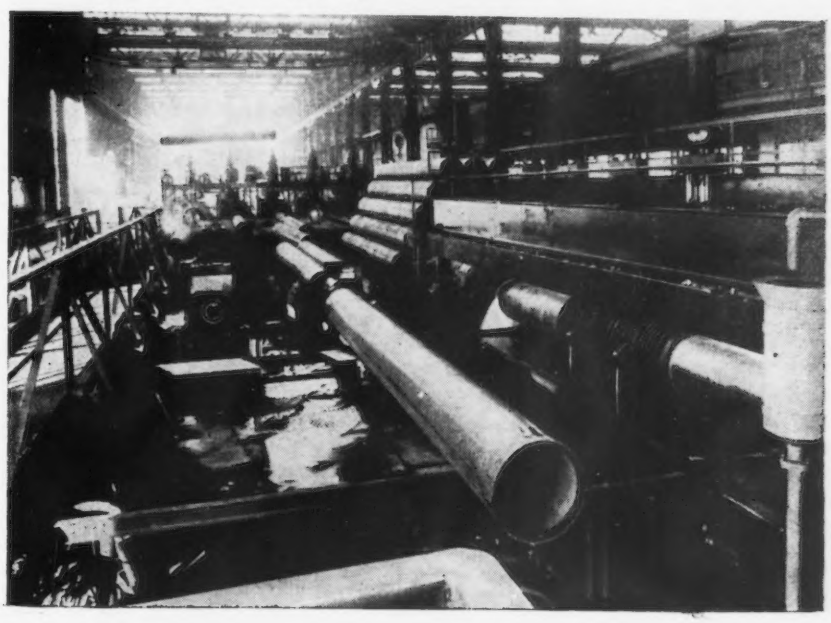
• • • **Purchasing Agents' Assn. of Toronto, after conferring with correspondents in various parts of Canada and the United States reported the labor front still steady and production in most lines high or moving toward full capacity rapidly. The association reported: "Though industrial production is increasing it cannot take care of peak demand due to shortages in steel, copper, brass, etc., which contributes to unbalanced inventories. The overall picture indicates continual improvement during the next few months as material shortages are overcome and quotas increased, and we can anticipate greater output, barring, of course, further strikes in key industries."**

Dealing with cast iron products the association pointed out that foundries continue busy, but are slow in delivery, but several Ontario foundries are seeking new work for future delivery. There is a serious shortage of good iron scrap and a request is made to all holders of scrap materials to put their scrap on the market and make it available for foundry production.

Nonferrous cast foundries also are actively engaged but slow insofar as deliveries are concerned. Prices of copper base castings have been increased 5¢ a lb, reflecting the government increase in ceiling prices on copper ingots. Special alloys containing tin, lead or antimony are difficult to obtain.

Regarding nonferrous semiprocessed products, the association states that purchasers of brass and copper tubes, sheets and bars from Canadian mills are still on quota and this will curtail production of electrical apparatus and motors during the next few months. The price of copper and brass mill products were raised 5¢ a lb as of Feb. 1.

BIGGER INCH: ***A behind the scenes picture of what, according to West Coast sources, will be the country's largest high pressure transmission line. In this operation at the Consolidated Steel Co. Los Angles plant the 30-ft pipe lengths are subjected to hydraulic pressure of 1200 to 1600 psi to expand the diameter by approximately ½ in. to 30 in. exactly. It will be used in a 1200-mile natural gas line from Dumas, Tex. to Santa Fe Springs, outside Los Angeles which will also include 24-in. and 26-in. lengths.***



Industrial Briefs . . .

• NEW GENERAL OFFICE—Portable Products Corp., a Pittsburgh organization operating a total of eight manufacturing plants in the United States and Canada, have opened a new general sales office which occupies an entire floor of the Woolworth Bldg., New York. It will correlate sales activities for the following divisions and subsidiaries of the corporation. Coldwell-Philadelphia Lawn Mower Div., Newburgh, N. Y.; Paul & Beekman Div., Philadelphia; C. J. Tagliabue Div., Brooklyn; Portable Products Div., Pittsburgh; Portable Safety Div., Pittsburgh; and the following subsidiaries—The American Pad & Textile Co., Greenfield, Ohio; General Television & Radio Corp., Chicago; Great Western and LaMar Fuse Companies, Pittsburgh.

• BROACHING FILMS — The Broaching Tool Institute now offers three 16 mm. motion picture sound films to manufacturers who wish to educate their employees on the various phases of broaching and broaching technique. They are entitled: Broaching an Internal Keyway; Single Ram Vertical Surface Broaching; and Double Ram Verticle Surface Broaching. They may be acquired without charge by writing to the Broaching Tool Institute, 74 Trinity Place, New York.

• CASE EXPANDING — The J. I. Case Co., Racine, Wis., has purchased its second plant at Bettendorf, Iowa, from the WAA at a bid of $1,250,000. The plant adjoins the old International Harvester Co. tank arsenal formerly bought by Case for $1,023,000.

• CHEVROLET BUYS—The Aluminum Forgings plant at Saginaw has been leased from WAA by the Chevrolet Div. of General Motors Corp. The Chevrolet Div. plans to make transmission parts, bumpers and other service parts at the plant, with a proposed employment of 500 workers.

• BUILDS AT PADUCAH — The Modine Mfg. Co., Racine, Wis., has begun construction of the first of three new buildings at its branch plant in Paducah, Ky.

• NEW COMPANY — Fleet Aircraft & Mfg., Ltd., of Ft. Erie, Ontario, Canada, has announced the formation of a new company, Fleet Mfg. Inc., with offices in Buffalo. Special emphasis will be placed on the Cabin-Car, a new house-trailer recently placed on the market.

• WAA Administrator R. M. Littlejohn has set a goal of $3 billion worth of surplus consumer and producer goods as the quantity of surplus consumer and producer goods which must be disposed of during the period of Feb. 1 through May 15. Regional offices have been given individual quotas.

• MIDGET CAR — The Midget Motor Car Mfg. Corp., Buffalo, has announced plans to start quantity production May 1 of a small, light automobile, powered with a 26 hp Continental motor, to sell for about $950.

The first model, the "Playboy," will be a convertible, 13 ft long, 54 in. high and 58 in. wide, weighing 1820 lb. The L-head, four-cylinder motor will be mounted in the rear, with a luggage compartment in the front part of the car. Other specifications include 4-wheel hydraulic brakes; built-in under-the-seat heater, built-in aerial, automatic choke, sealed-beam headlights and welded all-steel body. The gas tank holds seven gallons.

• ACQUIRES CARTER STOCK—Fruehauf Trailer Co., Detroit, has agreed to acquire all the stock of the Carter Mfg. Co., Inc., and Carter, Inc. of Memphis, Tenn. The Carter Co. produces Carter trailers and has about 300 employees at the manufacturing plant in Memphis and sales and service branches in Memphis, Nashville and Birmingham.

Stiffer Laws Seen As Due to Labor Leaders' Lack of Cooperation

Washington

• • • **The attitude of labor** itself, as evidenced by union leaders in testimony before the Senate Labor Committee, seems to be strengthening the determination of Congress to formulate legislation which would restrict unbridled use of power by labor unions, according to political observers.

"It has been demanded in no uncertain terms by the public," a committee member declared, "and it is certain that remedial action must be taken this session whether labor likes it or not."

Complaint of the Senate group is that instead of working with the committee to draw up constructive legislation, labor leaders are taking a negative attitude by opposing all proposals as "vicious" attacks on labor, inspired by hysteria and propaganda.

"As a reward for faithful and patriotic war service," CIO's Philip Murray told the Committee, "some 250 bills have been introduced, vicious legislation which in one way or another seeks to 'punish' labor . . . to shackle labor's rights."

The present labor unrest, the CIO chieftain feels, is the result of "maldistribution of national wealth (income)" and the reluctance of industry to bargain. He told the committee that the blame for the 1946 steel strike rested on industry alone—that labor immediately accepted the White House compromise of 18½¢ but that industry refused.

Asked whether industry's refusal was not caused by OPA denial of price increases sufficient to enable it to meet wage demands, Mr. Murray replied that the reason behind industry's action was beside the point.

Labor feels that the proposed Ball-Taft-Ellender bill not only includes the same provisions in the rejected Case bill of last year but is "even more oppressive . . . sniping at various portions of the national labor policy." Labor leaders are particularly opposed to all proposals to ban either the closed shop or industry-wide bargaining.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

3000 Tons, Los Angeles, General Petroleum Co. building, to Consolidated Steel Corp., Los Angeles.

800 Tons, Pawtucket, R. I., telephone exchange to Bethlehem Steel Co., Bethlehem, Pa.

500 Tons, Westbrook, Maine, paper mill for S. D. Warren Co. to American Bridge Co., Pittsburgh.

345 Tons, Racine Wis., St. Catherine's high school building to Milwaukee Bridge Co., Milwaukee.

• • • Fabricated steel inquiries this week included the following:

5000 Tons, Washington, K St. viaduct, District of Columbia Commission, due Mar. 20.

2000 Tons, Passaic, River, Route S-3, N. J., New Jersey Dept. of Highways, bids rejected.

900 Tons, Rochester, Iowa, highway bridge, State of Iowa.

600 Tons, Minneapolis, 30 propane tanks, United Petroleum Gas Co.

400 Tons, Tacoma, Wash., six bridges, U. S. Engineer.

230 Tons, Cumberland County, Pa., bridge, Pennsylvania Dept. of Highways, Mar. 21.

195 Tons, Elk County, Pa., bridge, Pennsylvania Dept. of Highways, Mar. 21.

170 Tons, Lancaster-Chester Counties, Pa., bridge, Pennsylvania Dept. of Highways, Mar. 21.

• • • Reinforcing bar awards this week included the following:

1000 Tons, Barbodoes Island, Pa., Philadelphia Electric Co., foundation for power plant, through Dravo Co., Pittsburgh, to Truscon Steel Co., Youngstown, Ohio.

• • • Reinforcing bar inquiries this week included the following:

1400 Tons, Odair, Wash., Grand Coulee pumping plant, Bureau of Reclamation, Denver, Inv. G-38,247-A.

965 Tons, Kingman, Ariz., Davis power plant, Bureau of Reclamation, Denver, Inv. 7478-A.

495 Tons, Odair, Wash., Grand Coulee machine shop, Bureau of Reclamation, Denver, Inv. G-38,248-A.

320 Tons, Tucumcari, N. M., Conchas Canal structures, Bureau of Reclamation, Denver, Spec. 1698, bids to Apr. 10.

• • • Plate awards this week included the following:

470 Tons, Denver, steel pipeline from east portal of Adams Tunnel to Big Thompson River, to Carnegie-Illinois Steel Corp., Pittsburgh.

430 Tons, Cottage Grove, Ore., steel pipe, to Armco Drainage & Metal Products Co., New Orleans.

• • • Paving mesh inquiries this week included the following:

270 Tons, Marshall County, Ill., paving project F-5 State Highway Commission, reported Feb. 13, all bids now rejected.

• • • Railroad car awards this week included the following:

The following railroads have placed orders with the American Car & Foundry Co., New York: Wabash R.R. Co.—500 50-ton all steel box cars; and Detroit, Toledo & Ironton R.R. Co.—200 50-ton steel box cars.

• • • Railroad car inquiries this week included the following:

The Santa Fe is inquiring for 500 50-ton auto box cars, the Illinois Central is inquiring for 1000 50-ton hoppers, and the Southern Pacific Equipment Co. is inquiring for 500 70-ton flat cars.

Bethlehem Asks That New Contract Include Ban on Foremen Union

New York

• • • Independence of foremen from union "domination or interference" highlighted a list of demands made by Bethlehem Steel Co. upon the United Steelworkers of America (CIO) in the bargaining conferences which were resumed here last week to continue negotiations of a new agreement to replace the one which expires on April 30.

"Union organization of foremen would destroy the foremen's authority and deny to them their true function as members of management," the company stated.

"Provision must be made in the agreement between the company and the union to assure that members of the supervisory force, and particularly the foremen, shall be free to carry out their managerial duties, without union domination or interference."

The **company also** proposed to limit the agreement to wages, hours and the conditions under which the men work, as contrasted with provisions directed to external matters, such as social and economic changes.

A third demand was that the agreement should not contain any provision for compulsory union membership.

Other proposals presented by the company were:

The agreement shall be binding on the union's Locals and local officers.

Additional provisions should be made to protect the company, during the life of the agreement, against strikes, slow-downs or other forms of organized interference with production.

Vacations should be granted only to those employees who have worked regularly during the preceding year.

Holidays not worked should not be considered as days worked in determining whether an employee has worked five days in a week after which he must be paid overtime.

See Congress Acting To Ban Foremen Unions

Washington

• • • Barring supervisory employees from unionization became an increased prospect as the result of testimony before the House Labor Committee on Feb. 22. Request that Congress ban such organization so that supervisory employees will remain a part of management was made before the House Labor Committee on Feb. 22 by three plant foremen, Joseph Cox, Dayton, Ohio, Floyd Rhoad, Jackson, Mich., and Angus McIntyre, Detroit. For some time it has been evident that there is a growing sentiment in the new Congress against the present NLRB ruling that under the Wagner Act foremen have the right to unionize as an appropriate collective bargaining unit. Previously the board held that the Wagner Act did not authorize unionization of supervisory employees. It later approved such unionization. One of the first results of the finding was the unionization of employees at Jones & Laughlin Steel Corp. captive mines. J & L has taken the case to court.

NLRB Reverses Itself In Union Election Case

Washington

In a face about, NLRB evidently aware of the temper of Congress to clip the Board's wings, held on Feb. 22 that a union, defeated at an election by another union as a bargaining agent, is not entitled to any protection under the Wagner Act. The decision related to a strike that was designed to force employers to violate that Act in a recognition case. There are bills pending which would outlaw such strikes and President Truman has urged such legislation.

MACHINE TOOLS

. . . News and Market Activities

New Orders for Tools Lagging, No Immediate Change Expected

• • • **Machine tool** markets, new and used, were still in the doldrums this week and unless new orders appear suddenly in unexpected numbers, February will prove as poor a month as some of the experts predicted.

According to qualified observers, new orders have been on the wane since the first of the year, and some of the more pessimistic prognosticators are of the opinion that there will be little change for the better until April or May.

With the raw material cost spiral daily achieving new postwar highs, machine tool users and many other industrialists, have entered into a new era of cost-consciousness which comes at a bad time for the machine tool trade. In the present situation, many machine tool customers, if they are buying at all, are buying from War Assets Administration's big inventory.

In Detroit the market shows little change with most producers acutely conscious of the present and future effects of recent decisions by automobile producers to delay indefinitely the introduction of new models. All types of machine tools are feeling the effects of this retrenchment, including welding equipment, and the fact that General Motors has this week delayed for two additional months, until May 15, its decision on the light car to be produced in Cleveland is anything but buoyant news. It is true that expendable production tools continue in high demand and some hopes in the tool and die industry were raised this week as General Motors placed some orders for the tooling of its "B" body.

Enough information on transmission developments has leaked out to indicate that while engineering appears to be well along, there are still obstacles to large-scale production of an intricate die casting which is the so-called "brain" of a torque converter. Once this production problem is solved, it is hoped that important transmission developments may come rather quickly.

Sees WAA's Discount on Tools Aiding Home Disposal And Promoting Exports

o o o

WAA's 12½ pct price discount on surplus standard general purpose machine tools granted Feb. 7 to machine tool rebuilders, manufacturers, exporters, dealers and other distributors who purchase for resale has attracted the interest of some machine tool builders.

Recommended and approved by the Metalworking Machinery & Equipment Industry Advisory Committee, the discount is expected to also promote the export of surplus machine tools and accelerate disposals in the domestic market.

WAA hoped that the 12½ pct discount would encourage rebuilders and manufacturers to purchase for their own stock for rebuilding and resale with the discount serving to "compensate for the cost of performing the distributive function."

Some machine tool builders were in position to take advantage of this discount and have done so, but others report that the size of WAA's inventory is such that selling rebuilt machines against many in the surplus which are not old and therefore do not require rebuilding is feasible at the present time.

One builder, discussing this situation, pointed out that a machine selling for $1300 at WAA would have to bring as much as $3500 rebuilt. If a new machine of the same type cost about $4500, the rebuilt unit could be sold against a new machine very handily, but not against a $1300 unit from surplus and in good condition.

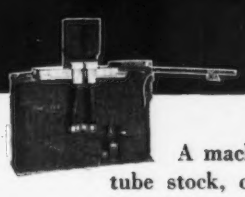
As the better machines continue to move out of WAA warehouses, a greater interest in rebuilding under this plan will doubtless be evidenced by the industry. At present, rebuilding costs are very high in most shops in comparison with prewar costs, primarily because the personnel required by this work is in short supply temporarily.

It is understandable why most New England machine tool manufacturers are taking the flood of surplus equipment on the market somewhat philosophically, if 1946 earnings statements, now making their appearance, are studied. These reports with few exceptions show substantial increases in earnings after taxes and all other charges and, in some instances, preferred dividends. It was not uncommon to show earnings more than double those of 1945.

Further, 1946 wound up with current assets topping current liabilities, two, three, and even more times. Current assets included liberal liquid cash and government bond holdings. Inventories, as a rule, were the smallest in years. The financial standing of the average firm was exceptionally sound last Dec. 31.

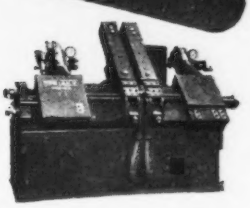
With machine tool business fairly evenly divided between foreign and domestic business, production is at capacity. Backlogs are being reduced at fair pace and management is watching inventories carefully. Recent coal industry difficulties in Great Britain are stimulating some feeling that the need for machine tools from this country will be accelerated by the inability to obtain tools in England. In fact, this feature is building hopes of better volume from this source.

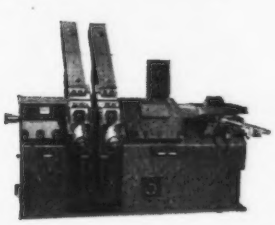
Sciaky Announces a Complete Line of *Advanced** Flash Welding Equipment

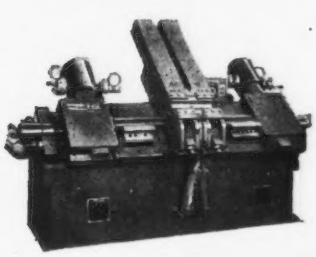


A machine for most every flash welding job—mitred sash, bar and tube stock, castings, etc.—is included in this series of *modern* welders. Revolutionary features in design and construction put these machines years ahead—in weld quality, flexibility and long life. Capacities range from .90 sq. in. cross sectional area on small hand-operated machines up to 5 sq. in. on large, completely automatic power-operated welders.

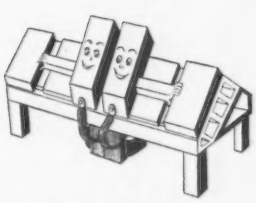
*and here's what we mean by **Advanced**



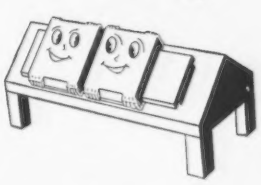




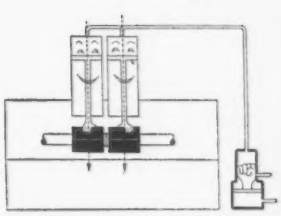
FRAMES are constructed as a sturdy, self-contained beam. Conductors from transformer to dies are placed *outside* the frame—eliminating need for weakening cutout and protecting transformer from flash sparks.



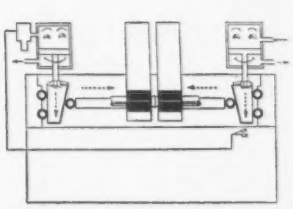
PLATENS move on a wide, rigid, T-shaped bed. Stresses are distributed over both upper and lower large, flat bearing surfaces. Accurate guiding is assured by narrow key. Tapered gibs maintain proper clearance.



CLAMPS are actuated by a booster-supplied high pressure hydraulic system. This allows cylinders of small diameter to be used which can apply force *directly in line* with clamps.



FLASHING and UPSETTING is controlled by air cylinders driving wedge-shaped cams between rollers. On power-operated welders, both platens move to allow independent control of flashing and upsetting. Heavy duty machines are equipped with two transformers—one connected to upper dies and the other to lower dies. Thus, perfect distribution of heat is assured on work such as large tubes.



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NONFERROUS METALS

. . . News and Market Activities

Might Lease Canaan Magnesium Producer

Canaan, Conn.

• • • **Although negotiations** are still in the preliminary stages, the New England Lime Co. of Adams, Mass., might be willing to enter into a lease with WAA to take over the Canaan magnesium production plant, according to C. C. Loomis, president. The plant, which employs the ferrosilicon process for magnesium production, was operated by the New England Lime Co. during the war and has since then been held in a standby condition by the government for possible defense needs. The plant has an annual capacity of 5000 net tons of ingots. It is said that little or no additional equipment or facilities would be required to replace the plant in service. Although no bid has yet been offered for the facility by the company, present plans would contemplate pricing its production on a competitive basis with the Dow Chemical Co. whose plant at Freeport, Tex. is now the sole primary producer of magnesium.

•

Copper

• • • **In contrast with** the rather reasonable supply of copper reported by the brass mills several months ago their need of copper now is most acute and has resulted in the curtailment of some production as indicated in the report of the copper branch of OTC of 215.5 million lb production by brass mills in December as compared to 225.2 million lb in November, the peak of postwar production. It is conceivable that the copper shortage may cause a reduction of operations of some brass and wire mill facilities, most of which are now being operated on a partial 3-shift basis.

The copper shortage is directly tied up with the lack of a decision by Congress as to the application of the 4¢ duty on imports payable under current regulations. As predicted earlier, the end of the copper stockpile is approaching and the payment of duty assumes paramount importance in establishing the domestic copper price. Producers are unwilling to raise the price of copper unless forced to do so under pressure of the world price as modified by the payment of duty. Meanwhile some consumers are reported to be buying imported copper. It is believed that this development is confined to consumers purchasing for export production on which they can recover the tariff payment.

The imports of copper contracted for by RFC before the end of the year are continuing to come into the country. The question that has been troubling the industry is whether the government will sell this metal to domestic consumers at a price which will include the tariff. Since the copper was purchased at a price of 17.50¢ this would bring the cost to consumers up to 21.50¢ delivered Connecticut Valley.

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Zinc

• • • **The shortage** of zinc still continues acute in Prime Western and Special High Grade with other grades continuing in reasonably adequate supply. Consumers who are unable to obtain their requirements from producers are obtaining zinc from the government stockpile although it is often necessary to accept shipment of grades other than those desired because of the unbalanced condition of government stocks in the grades in most critical demand. Canadian shipments of zinc into the United States are reported to continue and it is the opinion of the trade that with current heavier production reported by the American Zinc Institute to be better than 72,000 tons in January, the second quarter supply position may be better. However it is noted that overall stocks reported by the Institute have been steadily declining over a long period and stand at the end of January at 173,337 net tons. There is no immediate price action in prospect.

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Lead

• • • **To date there** has been no change in the price of lead, although considering that the export price is now reported at 12¢ f.a.s. Gulf Ports, there is some possibility of a price increase in the offing. Present lead prices were established on the basis of an export price of 11½¢ so that there is the prospect that common lead may rise on the domestic market to 11.25¢ or 11.50¢.

According to reliable sources, sales of 60,000 tons of primary lead have been made for February delivery. This does not include some 6000 tons allocated by CPA for February but does include some foreign lead sold by custom smelters. This reported tonnage is comparable to sales of a year ago when the lead supply position was not quite as critical as at present. It is reported that lead is beginning to come in from Canada and also said that some lead may be expected from Australia.

•

Cadmium

• • • **The increase in producer** prices to $1.75 has not diminished the demand for the metal according to reports in the trade. It is expected that currently increasing production of lead and zinc may step up the output of cadmium. As a byproduct of the production of these two metals, cadmium supply is largely fixed by their rates of production.

Nonferrous Metals Prices

Cents per pound

	Feb. 19	Feb. 20	Feb. 21	Feb. 22	Feb. 24	Feb. 25
Copper, electro, Conn.	19.50—20.50	19.50—20.50	19.50—20.50	19.50—20.50	19.50—20.50	19.50—20.50
Copper, Lake, Conn.	19.625	19.625	19.625	19.625	19.625	19.625
Tin, Straits, New York	70.00	70.00	70.00	....	70.00	70.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	12.80	12.80	12.80	12.80	12.80	12.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	28.25
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	$27.50
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. Valley	19.50 to 20.50
Copper, lake, Conn. Valley	19.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$110.00
Lead, St. Louis	12.80
Lead, New York	13.00
Magnesium, 99.8 + %	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$88 to $90
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$58 to $61
Silver, New York, cents per oz.	73.75
Tin, Straits, New York	70.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	$ 6.00

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	20.50
No. 120	20.00
No. 123	19.50
80-10-10 ingot	
No. 305	23.50
No. 315	22.00
88-10-2 ingot	
No. 210	25.75
No. 215	24.75
No. 245	21.75
Yellow ingot	
No. 405	16.25
Manganese Bronze	
No. 421	18.25

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	17.75—18.00
0.60 copper, max.	17.50—17.75
Piston alloys (No. 122 type)	15.75—16.25
No. 12 alum. (No. 2 grade)	15.50—15.75
108 alloy	15.75—16.00
195 alloy	16.25—16.50
AXS-679	15.75—16.00
Steel deoxidizing aluminum, notch-bar, granulated or shot.	
Grade 1—95 pct-97½ pct	16.75—17.00
Grade 2—92 pct-95 pct	15.75—16.00
Grade 3—90 pct-92 pct	15.25—15.50
Grade 4—85 pct-90 pct	14.75—15.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	34⅞
Electrodeposited	28⅝
Rolled, oval, straight delivered	29½
Curved, 18 in. or longer, delivered	29½
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	31⅝
Zinc, Cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver, 999 fine	
Rolled, 1000 oz lots, per oz.	75

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz lots, per oz	74.5
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	.0635

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb. f.o.b. mill)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75. Base quantity 30,000 lb.

Round Rod: M, diam in. ⅛, 55¢; ¼, 47¢ ⅜, 46¢; ½, 45¢; ¾, 44¢; 1¾, 43.5¢; 2, 42.5¢; 3, 41.5¢; 4, 42.5¢ 5, 43.5¢; 6 & 7 in., 44¢. Base price, 5000-10,000 lb.

Square and Hexagonal Bar: M, diam in. ⅛, 58¢; ¼, 50¢; ⅜, 48¢; ½, 47.5¢; ¾, 46.5¢; 1¾, 45.5¢; 2, 44.5¢; 3, 43.5¢; 4 & 5 in. 44.5¢; 6 & 7 in., 45¢. Base quantity, 5000-10,000 lb.

Tubing: Varies with wall thickness and outside diameter.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.25
Large, over 12 in.	14.25

Copper, Brass, Bronze

(Cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	30.78	..	30.93
Copper, hot-rolled	....	27.28	....
Copper, drawn	....	28.28	....
Low brass, 80 pct	37.52	28.71	29.02
High brass	36.03	27.22	27.53
Red brass, 85 pct	38.03	29.22	29.53
Naval brass	27.50	26.25	32.19
Brass, free cutting	....	22.28	....
Commercial bronze	39.06	30.25	30.56
Manganese bronze	31.07	29.57	35.69
Phosphor bronze, 5 pct	....	49.07	48.82
Muntz metal	27.19	25.94	30.38
Everdur, Herculoy Olympic, etc.	34.45	34.73	35.79
Nickel silver, 5 pct	....	38.11	36.34
Architectural bronze	26.01	....	....

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of 15,000 lb or less)

Cartridge brass turnings	12⅞
Loose yellow brass trimmings	13⅜

Copper and Brass

No. 1 heavy copper and wire	15½—16
No. 2 heavy copper and wire	14½—15
Light copper	13½—14
Auto radiators (unsweated)	10¾—11¼
No. 1 composition	14 —14¼
No. 1 composition turnings	13 —13¼
Clean red car boxes	12 —12½
Cocks and faucets	11¼—11¾
Mixed heavy yellow brass	9¾—10¼
Old rolled brass	9½—10
Brass pipe	11½—11¾
New soft brass clippings	12¼—12¾
Brass rod ends	11½—11¾
No. 1 brass rod turnings	11½—12

Aluminum

Alum. pistons with struts	4½—5
Aluminum crankcases	6¾—7
2S aluminum clippings	8¼—8½
Old sheet & utensils	7 —7¼
Mixed borings and turnings	2 —2½
Misc. cast aluminum	6¼—6¾
Dural clips (24S)	5¾—6

Zinc

New zinc clippings	7 — 7½
Old zinc	5¼ — 5¾
Zinc routings	3 — 3½
Old die cast scrap	3 — 3¼

Nickel and Monel

Pure nickel clippings	22 —23
Clean nickel turnings	17 —18
Nickel anodes	19½—20½
Nickel rod ends	20 —21
New Monel clippings	14 —15
Clean Monel turnings	9 —10
Old sheet Monel	12 —12½
Old Monel castings	10 —11
Inconel clippings	10 —11
German silver clippings, mixed	10½—11
German silver turnings, mixed	7 — 7¼

Lead

Soft scrap lead	11 —11½
Battery plates (dry)	6¼— 6½

Miscellaneous

Block tin	60
No. 1 pewter	46 —48
No. 1 auto babbitt	35 —36
Mixed common babbitt	12 —12¼
Solder joints	13¼—13¾
Siphon tops	38 —39
Small foundry type	15 —15½
Monotype	12½—13
Lino and stereotype	12 —12½
Electrotype	10 —10½
New type shell cuttings (nom.)	12 —12½
Clean hand picked type shells	5½— 6
Lino and stereo dross	6 — 6½
Electro dross	4 — 4½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.

Full lead sheets	16.25
Cut lead sheets	16.75
Lead pipe, manufacturing point	15.50
Lead traps and bends	List +38%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +38%
Lead wool	17.50

SCRAP

. . . News and Market Activities

Fierce Competition Forces Prices Higher

New York

• • • **Frantic inter-district competition during the past week caused some of the sharpest scrap price gains ever recorded. To halt raiding of their normal buying markets by outside interests, consumers in Birmingham stepped in with a $3.50 price boost for heavy melting steel. In Detroit the increase was $3. In Philadelphia, Boston and New York gains of $1 to $1.50 a ton were posted. Heavy melting advanced $2 in Cincinnati.**

The Dept. of Justice is looking into the scrap price picture, sources within the department reveal. Touched off by complaints of high steel and scrap prices, the department is now proceeding informally in the matter. Just what action the Justice Dept. can or will take is not yet known, department sources indicate.

Some scrap sources believe this week's price rises may touch off new price boosts in the major consuming centers. Cold weather cut shipments in some districts but few observers are inclined to blame the higher prices on the weather.

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PITTSBURGH — There is no sign of any easing of scrap demand despite the fact that Pennsylvania R. R. scrap sold last week below the going prices. PRR sold heavy melting at $34.50 a ton and specialties at $38, plus the 50c commission. Brokers and dealers are moving everything that comes their way for the simple reason they want no tonnages on hand if and when a price break occurs. Actually, every car now being shipped could be regarded or rejected by the mills, and this potential is making scrap interests very wary of current prices. B & O sold some scrap this past week at $35 a ton, earmarked for one large consumer who refused to pay higher than that price delivered at the plant. Despite the quotations this week, there is considerable scrap moving at higher and lower prices. The latter are mill-customer deals while the former are for scrap coming from outside the district.

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CHICAGO—Large scrap consumers in this area report that receipts in the past week have been ample to support the high operating rate. Inventories remain low but steel producers claim they aren't interested in trying to build up stocks at the present price level. They also will not permit furnaces to become idle, regardless of price, but as long as they can hold the present rate higher prices will be resisted with increased vigor. Railroad lists are appearing with more frequency and specialties are still attracting premium prices. There are still no signs of weakness in cast scrap prices and certain cast users report they are more desperate than ever.

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PHILADELPHIA—The price of heavy melting grades increased $1 last week under pressure of the serious shortage of scrap and pig iron in this district. Scrap shipments are being retarded by the shortage of freight cars. Mills are operating on a day-to-day basis and are greatly concerned over the possible effect of the recent snowfall on scrap preparation.

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NEW YORK — A strong tone again prevailed here with an across the board gain of $1.50 in all steel scrap grades. Under certain conditions of substantial tonnages or immediate delivery even higher prices could be secured. Since brokers have been operating on a day to day basis so as not to be caught short, last week's snowstorm which virtually halted dealer's shipments also cut broker purchases of any material not under cover.

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DETROIT—The scramble for scrap in the Detroit area continued without abatement as brokers were forced this week to offer as high as $33.75 on track against outside purchasers to deliver scrap against contracts already in force. Meanwhile large mill buyers in this territory remained on the sidelines although indications were they would soon be forced to bid into the present market. As usual, scrap moving on allotments to mills was going at negotiated prices substantially under the quotation for the open market. Some resistance to prices of $45 per gross ton for foundry grades has been reported and the fact that grading requirements are being more vigorously enforced would indicate this market is losing some of its firmness.

•

CLEVELAND — Most of the scrap market activity this week was in the Valley, where a $42 order for low phos set off the fireworks. Openhearth grades from remote points are moving freely at $38 to $39, and according to reports, one consumer has paid $42 for good No. 1. Most consumers are fighting hard for scrap and getting less than last week for their efforts, with bad weather teaming up against them. Some major consumers are trying to stabilize the market by refusing to pay more than $35 for scrap originating in local basing points, but scrap prices continue to be almost anybody's guess.

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BOSTON — Business has picked up and prices are higher, but there is not the snap to things noted early in February. Heavy steel is generally $31 a ton, a new peak and $6 above the Jan. 1 level. Most brokers say the market has hit the roof, yet keep on bidding for material. For cast $50 has been done notwithstanding the trade generally quotes $40 to $45. No actual sale at less than $45 was reported the past week, however.

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BUFFALO — Higher prices for openhearth scrap last week brought a moderate increase in local receipts until another weekend blizzard reduced the movement to a trickle on Monday. Yards were plugged again and crews were put to work clearing away the drifts. Some trade leaders were inclined to believe the runaway market here had reached its peak at $35. A reasonably early opening of navigation, possibly about Apr. 15, undoubtedly would ease the situation, although no permanent relief from the nip and tuck state of scrap supplies is foreseen until steel production catches up with demand and the ingot rate falls.

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CINCINNATI — Heavy melting steel scrap advanced $2 a ton here this week and machine shop turnings were up $1.50, while shoveling turnings moved $2.50 a ton higher. Sharp gains were also chalked up in cast grades and in scrap rails.

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ST. LOUIS — With most shipments coming from the South, the sharp drop in temperature in this region has not affected the movement of scrap iron to the St. Louis industrial district. While there has been an improvement in the movement since higher prices prevailed. The tonnage is just enough to account for the current melt of the steel mills.

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BIRMINGHAM — Heavy melting steel has advanced $3.50 per ton here as large tonnages of material move past this area for the higher prices obtainable at northern points. Movement to St. Louis, Chicago, the Valley, Pittsburgh and other Ohio river mills is abnormally large although local consumers are obtaining sufficient scrap to maintain high operations.

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MILWAUKEE — Prices jumped from $2 to $3 a ton for top grade material due to low stock and unprecedented demand, particularly from Chicago district steel mills and aggravated by the withdrawal from the local market of eastern producers. One local dealer said the situation now is far worse than during the war and that he is shipping everything he can lay his hands on to the Chicago mills.

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TORONTO — Canadian scrap iron and steel markets border on stagnation. Some local dealers say they have received little or no scrap in their yards for the past 3 weeks, and dealers whose delieveries averaged 400 tons weekly in normal times now are down to less than 50 tons weekly. No scrap is reaching the city from outside points and only small lots are being received from industrial plants.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$35.00 to $36.00
RR. hvy. melting	34.50 to 35.00
No. 2 hvy. melting	35.00 to 36.00
RR. scrap rails	41.00 to 42.00
Rails 3 ft. and under	44.00 to 45.00
No. 1 comp'd bundles	35.00 to 36.00
Hand bdld. new shts.	35.00 to 36.00
Hvy. axle turn.	35.00 to 36.00
Hvy. steel forge turn.	35.00 to 36.00
Mach. shop turn.	28.50 to 29.00
Short shov. turn.	29.50 to 30.00
Mixed bor. and turn.	28.50 to 29.00
Cast iron borings	28.50 to 29.00
No. 1 cupola cast	42.00 to 43.00
Heavy breakable cast	36.00 to 37.00
Malleable	41.00 to 42.00
RR. knuck, and coup.	38.00 to 38.50
RR. coil springs	38.00 to 38.50
Rail leaf springs	38.00 to 38.50
Rolled steel wheels	38.00 to 38.50
Low phos.	40.00 to 41.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$32.00 to $32.50
No. 2 hvy. melting	32.00 to 32.50
No. 1 bundles	32.00 to 32.50
No. 2 dealers' bndls	32.00 to 32.50
Bundled mach. shop turn.	32.00 to 32.50
Galv. bundles	30.00 to 30.50
Mach. shop turn.	27.50 to 28.00
Short shov. turn.	29.50 to 30.00
Cast iron borings	28.50 to 29.00
Mix. borings & turn.	27.50 to 28.00
Los. phos. hvy. forge	36.00 to 37.50
Low phos. plates	34.50 to 35.00
No. 1 RR. hvy. melt.	33.00 to 33.50
Reroll rails	44.75 to 45.50
Miscellaneous rails	41.50 to 43.00
Angles & splice bars	42.00 to 43.00
Locomotive tires, cut	40.00 to 43.00
Cut bolster & side frames	36.00 to 37.00
Standard stl. car axles	43.00 to 44.00
No. 3 steel wheels	39.50 to 40.00
Couplers & knuckles	45.00 to 47.50
Malleable	45.00 to 49.00
No. 1 mach. cast	45.00 to 46.00
Rails 2 ft. and under	46.00 to 48.00
No. 1 agricul. cast	38.50 to 39.00
Hvy. breakable cast	37.50 to 38.00
RR. grate bars	40.00 to 40.50
Cast iron brake shoes	41.50 to 42.00
Stove plate	41.00 to 42.00
Cast iron carwheels	39.00 to 40.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	34.00
No. 1 bundles	34.00
No. 2 bundles	34.00
Mach. shop turn.	$25.00 to $25.50
Shoveling turn.	26.00 to 26.50
Cast iron borings	26.00 to 26.50
Mixed bor. & turn.	25.00 to 25.50
Low phos. plate	34.00 to 35.00
No. 1 cupola cast	39.00 to 40.00
Hvy. breakable cast	35.00 to 36.00
Stove plate	31.00 to 32.00
Scrap rails	35.00 to 36.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	30.00 to 31.00
Nos. 1 and 2 bundles	30.00 to 31.00
Busheling	30.00 to 31.00
Turnings, shovelings	26.00 to 26.50
Machine shop turn	24.00 to 24.50
Mixed bor. & turn.	24.00 to 24.50
Cl'n cast. chem. bor.	24.00 to 25.00
No. 1 machinery cast	40.00 to 50.00
No. 2 machinery cast	40.00 to 50.00
Heavy breakable cast	40.00 to 50.00
Stove plate	45.00

DETROIT

Per gross, ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$32.75 to $33.25
No. 2 hvy. melting	32.75 to 33.25
No. 1 bundles	32.75 to 33.25
New busheling	32.75 to 33.25
Flashings	32.75 to 33.25
Mach. shop turn.	23.75 to 24.25
Short shov. turn.	24.75 to 25.25
Cast iron borings	$24.25 to $24.75
Mixed bor. & turn.	23.25 to 23.75
Low phos. plate	34.75 to 35.25
No. 1 cupola cast	41.25 to 44.25
Hvy. breakable cast	37.25 to 39.25
Stove plate	37.25 to 39.25
Automotive cast	nominal

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	34.00 to 35.00
No. 2 bundles	34.00 to 35.00
Mach. shop turn.	24.00 to 25.00
Shoveling turn.	27.00 to 28.00
Mixed bor. & turn.	24.00 to 25.00
Clean cast chemical bor.	31.00 to 32.00
No. 1 cupola cast.	45.00 to 47.00
Hvy. breakable cast	44.00 to 45.00
Cast. charging box	44.00 to 45.00
Clean auto cast	45.00 to 47.00
Hvy. axle forge turn.	34.00 to 35.00
Low phos. plate	36.50 to 37.50
Low phos. punchings	36.50 to 37.50
Low phos. bundles	35.50 to 36.50
RR. steel wheels	38.50 to 39.50
RR. coil springs	38.50 to 39.50
RR. malleable	44.00 to 45.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$32.25 to $33.00
Bundled sheets	32.25 to 33.00
Mach. shop turn.	27.25 to 28.00
Locomotive tires, uncut	34.50 to 35.00
Misc. std. sec. rails	37.00 to 38.00
Rerolling rails	40.00 to 41.00
Steel angle bars	35.00 to 37.00
Rails 3 ft. and under	40.00 to 41.00
RR. springs	36.50 to 37.00
Steel car axles	35.00 to 37.00
Stove plate	30.00 to 32.00
Grate bars	33.00 to 35.00
Brake shoes	33.00 to 35.00
Malleable	40.00 to 42.00
Cast iron carwheels	36.00 to 37.00
No. 1 machinery cast.	37.00 to 38.00
Breakable cast.	35.00 to 36.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$32.50 to $33.00
No. 2 hvy. melting	32.50 to 33.00
No. 2 bundles	32.50 to 33.00
No. 1 busheling	32.50 to 33.00
Long turnings	23.00 to 23.50
Shoveling turnings	27.50 to 28.00
Cast iron borings	22.00 to 22.50
Bar crops and plate	34.00 to 34.50
Structural and plate	34.00 to 34.50
No. 1 cast	39.00 to 40.00
Stove plate	35.00 to 36.00
Steel axles	35.50 to 36.00
Scrap rails	33.00 to 34.00
Rerolling rails	41.00 to 42.00
Angles & splice bars	37.00 to 38.00
Rails 3 ft. & under	36.00 to 37.00
Cast iron carwheels	39.00 to 39.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$34.50 to $35.00
No. 2 hvy. melting	34.50 to 35.00
Low phos. plate	41.00 to 41.50
Hydraulic bundles	34.50 to 35.00
Mach. shop turn.	28.50 to 29.50
Short. Shovel, turn.	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Elec. furnace punch.	41.00 to 41.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.00 to $32.50
No. 2 hvy. melting	32.00 to 32.50
Comp. black bundles	32.00 to 32.50
Comp. galv. bundles	32.00 to 32.50
Mach. shop turn.	25.00 to 25.50
Mixed bor. & turn.	25.00 to 25.50
Shoveling turn.	26.50 to 27.00
No. 1 cupola cast	40.50 to 41.00
Hvy. breakable cast	40.50 to 41.00
Charging box cast	$40.50 to $41.00
Stove plate	40.50 to 41.00
Clean auto cast.	40.50 to 41.00
Unstrip. motor blks	37.00 to 39.00
Cl'n chem. cast bor.	24.00 to 25.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$35.00
No. 1 bundles	35.00
No. 2 bundles	35.00
No. 2 hvy. melting	35.00
Mach. shop turn.	$28.00 to 29.00
Shoveling turn.	30.00 to 31.00
Cast iron borings	27.00
Mixed bor. & turn.	28.00 to 29.00
No. 1 cupola cast	35.00 to 40.00
Charging box cast	29.00 to 30.00
Stove plate	30.00 to 35.00
Clean auto cast	35.00 to 40.00
Malleable	42.00 to 45.00
Low. phos. plate	36.00 to 37.00
Scrap rails	30.00 to 32.00
Rails 3 ft. & under	38.00 to 40.00
RR. steel wheels	37.00 to 38.00
Cast iron carwheels	35.00 to 38.00
RR. coil & leaf spgs.	36.00 to 37.00
RR. knuckles & coup.	36.00 to 37.00
No. 1 busheling	35.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	32.00 to 33.00
Compressed sheet stl.	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
No. 2 bundles	32.00 to 33.00
Mach. shop turn.	27.00 to 28.50
Short shovel	27.00 to 28.50
No. 1 busheling	32.00 to 33.00
Steel axle turn.	32.00 to 33.00
Cast iron borings	26.50 to 27.50
Mixed bor. & turn.	26.50 to 27.50
No. 1 machinery cast	37.50 to 40.00
Malleable	42.50 to 45.00
Railroad cast	40.00 to 42.50
Railroad grate bars	35.00 to 37.00
Stove plate	37.50 to 38.00
RR. hvy. melting	32.00 to 33.00
Rails 3 ft. & under	41.50 to 42.00
Rails 18 in. & under	42.50 to 43.00
Rails for rerolling	37.00
Elec. furnace punch.	39.50 to 40.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50
No. 2 hvy. melting	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	13.00
Elec. furn. 1 ft. und.	19.50
No. 1 cupola cast.	32.00
RR. hvy. melting	20.50

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50
No. 2 hvy. melting	19.50
No. 1 bales	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	14.50
No. 1 cupola cast	25.00
RR. hvy. melting	20.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melting	$20.50
Elec. furn. 1 ft. und.	22.50
No. 1 cupola cast	29.00
RR. hvy. melting	20.00

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

* Ceiling price

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Feb. 25, 1947	Feb. 18, 1947	Jan. 21, 1947	Feb. 26, 1946
Hot-rolled sheets	2.50	2.50	2.50	2.425
Cold-rolled sheets	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip	2.50	2.50	2.50	2.35
Cold-rolled strip	3.20	3.20	3.20	3.05
Plates	2.65	2.65	2.65	2.50
Plates, wrought iron	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
*24 ga				
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes.	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.60	2.60	2.60	2.50
Cold-finished bars	3.20	3.20	3.20	3.10
Alloy bars	3.05	3.05	3.05	2.92
Structural shapes	2.50	2.50	2.50	2.35
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	6.15	6.15	6.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.30	3.30	3.30	3.05
Wire nails	3.75	3.75	3.75	3.25
Rails: (dollars per 100 lb)				
Heavy rails	$2.50	$2.50	$2.50	$43.39*
Light rails	2.85	2.85	2.85	49.18*
*per net ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$42.00	$42.00	$42.00	$39.00
Sheet bars	50.00	50.00	50.00	38.00
Slabs, rerolling	42.00	42.00	42.00	39.00
Forging billets	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.55	2.55	2.55	2.30
Skelp	2.35	2.35	2.35	2.05

Pig Iron: (per gross ton)	Feb. 25, 1947	Feb. 18, 1947	Jan. 21, 1947	Feb. 26, 1946
No. 2, foundry, Phila.	$32.51	$32.51	$32.43	$27.59
No. 2, Valley furnace	30.50	30.50	30.50	25.75
No. 2, Southern, Cin'ti	31.75	31.75	31.75	26.19
No. 2, Birmingham	26.88	26.88	26.88	22.13
No. 2, foundry, Chicago†	30.50	30.50	30.50	25.75
Basic, del'd eastern Pa.	33.67	33.67	31.93	27.09
Basic, Valley furnace	30.00	30.00	30.00	25.25
Malleable, Chicago†	30.50	30.50	30.50	25.75
Malleable, Valley	30.50	30.50	30.50	25.75
Charcoal, Chicago	42.99	42.99	42.99	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$35.50	$35.50	$32.25	$20.00
Heavy melt'g steel, Phila.	34.50	33.50	31.00	18.75
Heavy melt'g steel, Ch'go	32.25	32.25	29.75	18.75
No. 1, hy. comp. sheet, Det.	33.00	30.00	27.00	17.32
Low phos. plate, Youngs'n	41.25	37.25	34.25	22.50
No. 1, cast, Pittsburgh	42.50	42.50	40.38	20.00
No. 1, cast, Philadelphia	46.00	46.00	43.00	20.00
No. 1, cast, Chicago	44.25	44.25	44.25	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$9.00	$9.00	$8.75	$7.50
Foundry coke, prompt	10.25	10.25	8.50	9.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	19.75	19.75	19.50	12.00
Copper, Lake, Conn.	19.625	19.625	19.625	12.00
Tin, Straits, New York	70.00	70.00	70.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	8.25
Lead, St. Louis	12.80	12.80	12.80	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	28.25	28.25	28.25	14.50

Composite Prices . .

In accordance with usual practice, THE IRON AGE finished steel composite price has been revised this week, following receipt of fourth quarter 1946 shipment data. While no price changes have been made since Jan. 7, 1947, the change in the pattern of shipments produces a composite price slightly lower than that of 2.87255¢, the figure used last week which was based on third quarter 1946 shipments.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Feb. 25, 1947	2.86354¢ per lb.	$30.15 per gross ton.	$34.08 per gross ton.
One week ago	2.86354¢ per lb.	$30.15 per gross ton.	$33.75 per gross ton.
One month ago	2.86354¢ per lb.	$30.14 per gross ton.	$31.00 per gross ton.
One year ago	2.54490¢ per lb.	$25.37 per gross ton.	$19.17 per gross ton.

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1947	2.86354¢	2.86354¢	$30.15 Jan. 28	$30.14 Jan. 7	$34.08 Feb. 25	$31.00 Jan. 7
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	$30.14 Dec. 10	$25.37 Jan. 1	$31.17 Dec. 24	$19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 28	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35267¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95579¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia, and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) This base price for annealed, bright finish wire, commercial spring wire. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Delivered Kaiser Co. prices; includes 3 pct freight tax. (15) 0.035 to 0.075 in. thick by ¾ to 3⅛ in. wide. (16) Some producers are charging 2.75c.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS															
Carbon, rerolling	($35.00 f. o. b. mill)														
Carbon, forging	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00								
Alloy	$52.00	$52.00				$52.00	(Bethlehem, Massillon, Canton, Coatesville—$52.00)								
BILLETS, BLOOMS, SLABS						(Provo—$53.20)									
Carbon, rerolling	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00					$45.00		
Carbon, forging billets	$50.00	$50.00	$50.00	$50.00	$50.00	(Provo—$61.20, Duluth—$52.00[12]) $50.00	$50.00						$53.00		
Alloy	$61.00	$61.00				$61.00	(Bethlehem, Massillon, Canton—$61.00)						$64.00		
SHEET BARS							$50								
PIPE SKELP	2.35¢	2.35¢					2.35¢	2.35¢	(Coatesville—2.35¢)						
WIRE RODS	2.55¢	2.55¢		2.55¢	2.55¢	(Worcester—2.65¢)						3.27¢[13]			
SHEETS															
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.875¢	2.50¢			2.65¢	2.79¢	2.70¢
Cold-rolled [1]	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢				3.35¢	3.61¢	3.58¢
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢					3.84¢	3.75¢
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢				3.70¢	3.95¢	3.93¢
Long ternes [2] (10 gage)	3.55¢	3.55¢	3.55¢											3.95¢	3.91¢
STRIP															
Hot-rolled [3]	2.50¢	2.50¢	2.50¢	2.50¢[15]	2.50¢		2.50¢						2.65¢	2.93¢	2.88¢
Cold-rolled [4]	3.20¢	3.30¢		3.20¢			3.20¢			(Worcester—3.40¢)			3.35¢	3.61¢	3.58¢
Cooperage stock	2.80¢	2.80¢			2.80¢		2.80¢							4.09¢	
TINPLATE															
Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85		(Warren, Ohio—$5.75)		$6.157	$6.062[11]	
Electro, box {0.25 lb / 0.50 lb / 0.75 lb}	Deduct 90¢ from standard coke base box price. Deduct 70¢ from standard coke base box price. Deduct 50¢ from standard coke base box price.														
BLACKPLATE 29 gage [5]	3.60¢	3.60¢	3.60¢		3.70¢			3.70¢	3.70¢		(Warren, Ohio—$5.75)		3.99¢	3.90¢	
TERNES, MFG. Special coated, base box	Deduct 85¢ from standard coke base box price.														
BARS															
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢					3.285¢	2.75¢	3.01¢	2.96¢
Rail steel [6, 16]	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢									
Reinforcing (billet) [7]	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢				2.985¢	2.60¢	2.74¢	2.65¢
Reinforcing (rail) [7, 16]	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢						2.75¢		
Cold-finished [8]	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	(Detroit—3.25¢)							3.61¢	3.58¢
Alloy, hot-rolled	3.05¢	3.05¢				3.05¢	3.05¢	(Bethlehem, Massillon, Canton—3.05¢)					3.20¢		3.19¢
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢		3.80¢							3.95¢		
PLATE								(Coatesville, Claymont—2.80¢, Geneva Utah—2.80¢)							
Carbon steel [12]	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢	2.65¢				[13]3.46¢[14]		2.87¢	2.85¢
Floor plates	3.90¢	3.90¢												4.30¢	4.28¢
Alloy	3.79¢	3.79¢			(Coatesville—4.10¢)									4.01¢	3.895¢
SHAPES								(Geneva, Utah—2.85¢)							
Structural	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢	(Bethlehem—2.50¢)					3.41¢[14]		2.70¢	2.64¢
SPRING STEEL, C-R															
0.26 to 0.40 carbon	3.20¢			3.20¢			(Worcester—3.40¢)								
0.41 to 0.60 carbon	4.70¢			4.70¢			(Worcester—4.90¢)								
0.61 to 0.80 carbon	5.30¢			5.30¢			(Worcester—5.50¢)								
0.81 to 1.00 carbon	6.80¢			6.80¢			(Worcester—7.00¢)								
MANUFACTURERS' WIRE [9]															
Bright [10]	3.30¢	3.30¢		3.30¢	3.30¢		(Worcester—3.40¢, Duluth—3.35¢)					5.63¢[13]		3.71¢	3.68¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.25¢	4.25¢		4.25¢		(Worcester—4.35¢, Duluth—4.50¢)				(Trenton—4.50¢)		5.24¢[13]		4.66¢	4.345¢
PILING															
Steel sheet	3.00¢	3.00¢				3.00¢								3.41¢	3.36¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt.	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J. Phila., Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 to 8 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	4.20¢
Armature	4.50¢
Electrical	5.00¢
Motor	5.70¢
Dynamo	6.45¢
Transformer 72	6.95¢
Transformer 65	7.65¢
Transformer 58	8.35¢
Transformer 52	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	$2.50
Angle splice bars, 100 lb	3.00
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa.	2.95

	Base per lb
Cut spikes	4.50¢
Screw spikes	6.40¢
Tie plate, steel	2.80¢
Tie plates, Pacific Coast	2.95¢
Track bolts	6.50¢
Track bolts, heat treated, to rail roads	6.75¢
Track bolts, jobbers discount	62-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$6.75	$13.50

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.c. Pittsburgh, Washington, Coatesville, Pa.	24.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	Delivered San Francisco
Standard, galvanized and coated nails	$3.75†	$4.83
Cut nails, carloads, Pittsburgh base	5.30	....

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb	
Annealed fence wire	$3.95‡	$4.96
Annealed galv. fence wire	4.40‡	5.41

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham.

	Base column	
Woven wire fence*	84	107
Fence posts, carloads	82††	...
Single loop bale ties	86	110
Galvanized barbed wire**	94	114
Twisted barbless wire	94	...

*15½ gage and heavier. **On 80-rod spools in carload quantities. ††Pittsburgh; Duluth 90.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	HI Steel	Mayari R	Otiscoloy	Yoloy	Y-50	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	American Rolling Mill	Great Lakes Steel
Plates	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	....	4.10
Sheets										
Hot-rolled	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled	4.75	4.75	4.75	....	4.75	4.75	4.75	4.75	5.225*	4.55
Galvanized	....	5.40	....	....	....	5.40	....	....	....	....
Strip										
Hot-rolled	3.85	3.85	3.85	....	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled	....	....	4.75	....	....	4.75	4.75	4.75	5.00*	4.55†
Shapes	....	3.85	....	....	3.85	3.85	3.85	3.85	....	....
Beams	....	3.85	....	....	....	3.85	....	....	....	....
Bars										
Hot-rolled	4.00	4.00	4.00	....	....	4.00	4.00	4.00	....	4.00
Cold-rolled	....	....	....	....	....	....	....	4.60	....	....
Bar shapes	....	4.00	....	....	4.00	4.00	4.00	4.00	....	....

* 21 gage and lighter. † Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. F.ob. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only

Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	55½	41
¾-in.	58½	45
1 to 3-in.	60½	47½
Wrought Iron, buttweld		
½-in.	2	+20
¾-in.	11½	+10
1 and 1¼-in.	17	+ 2
1½-in.	22½	1½
2-in.	23	2
Steel, lapweld		
2-in.	53	39½
2½ and 3-in.	56	42½
3½ to 6-in.	58	44½
Steel, seamless		
2-in.	52	38½
2½ and 3-in.	55	41½
3½ to 6-in.	57	43½
Wrought Iron, lapweld		
2-in.	14½	+ 5½
2½ to 3½-in.	17	+ 1½
4-in.	21	4
4½ to 8-in.	19	2½

Extra Strong, plain ends

Steel, buttweld		
½-in.	54½	41½
¾-in.	58½	45½
1 to 3-in.	60	48
Wrought Iron, buttweld		
½-in.	6½	+14
¾-in.	12½	+ 8
1 to 2-in.	22	2
Steel, lapweld		
2-in.	52	39½
2½ and 3-in.	56	43½
3½ to 6-in.	59½	47
Steel, seamless		
2-in.	51	38½
2½ and 3-in.	55	42½
3½ to 6-in.	58½	46
Wrought Iron, lapweld		
2-in.	17½	+ 2
2½ to 4-in.	26	8½
4½ to 6-in.	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

O.D. in.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$15.29	$18.17	$15.00	$17.95
2½	12	20.57	24.43	20.11	24.07
3	12	22.87	27.18	22.26	26.68
3½	11	28.86	34.30	28.06	33.64
4	10	35.82	42.55	34.78	41.68

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in., del'd Chicago	$75.56
6-in. to 24-in. del'd New York	73.80
6-in. to 24-in., Birmingham	65.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	89.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
½ in. & smaller x 6 in. & shorter	55
9/16 & ⅝ in. x 6 in. & shorter	52
¾ in. x 6 in. & shorter	49
1⅛ in. and larger, all lengths	48
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Plow bolts	57

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	48
9/16 to 1 in. inclusive	47
1⅛ to 1½ in. inclusive	45
1⅝ in. and larger	44

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts *Base discount less case lots*	U.S.S.	S.A.E.
7/16 in. and smaller	..	51
½ in. and smaller	48	..
½ in. through 1 in.	..	48
9/16 in. through 1 in.	47	..
1⅛ in. through 1½ in.	45	46
1⅝ in. and larger	44	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

	Consumer
Packages, nuts separate	60 and 10
In bulk	74

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.25
F.o.b. Lebanon, Pa.	5.40

Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55 and 5

Cap and Set Screws

(In packages)	Percent Off List Consumer
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	56
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF_2 Content:	Base price per short ton
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$5.95
Old range, non-bessemer	5.80
Mesabi, bessemer	5.70
Mesabi, non-bessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	23¢ to 27¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31½¢
Copper, reduced, 150 and 200 mesh	29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	66¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	$2.00
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200 & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	33¢
Nickel, 150 mesh	51½¢
Silicon, 100 mesh	18.15¢
Solder powder, 100 mesh	8½¢ plus metal
Tin, 100 mesh	76.75¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.65
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	$2.65
Under 100 lb	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$8.75 to $9.25
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	10.00 to 10.50
Foundry, Byproduct	
Chicago, del'd	$16.10
Chicago, f.o.b.	15.10
New England, del'd	16.04
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, del'd	15.46
Buffalo, del'd	16.14
Ashland, Ohio, f.o.b.	13.35
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	15.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	12.35

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads Per 1000
Sec. quality, Ohio	57.00
First quality, Pa., Md., Ky., Mo., Ill., Ohio	65.00
First quality, New Jersey	70.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	59.00
Sec. quality, New Jersey	62.00
Sec. quality, Ohio	57.00
Ground fire clay, net ton, bulk	9.50

Silica Brick

Pennsylvania and Birmingham	$65.00
Chicago District	74.00
Silica cement, net ton (Eastern)	11.50
Chicago	12.50

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick

Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks	$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	22.00
in sacks	26.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. York, Pa.	10.05
Midwest, add 10¢; Mo. Valley, add 20¢	

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled (10 gage)	Cold-Rolled (10 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
**Philadelphia	$4.24	$5.33	$5.29*	$4.43	....	$4.40	$4.22	$4.48	$5.38	$8.37	$8.37	$9.88	$9.88
New York	4.42	5.72[1]	5.47	4.62	5.25	4.72	4.37	4.62	5.42	8.42	8.42	9.92	9.92
Boston	....	6.218	....	....	5.156	....	....	....	5.468	....	....	....	....
Baltimore	4.09	....	5.14	....	....	4.39	4.34	4.45	5.35	....	....	....	....
Norfolk	4.35	....	....	....	....	4.50	4.50	4.75	5.50	....	....	....	....
Chicago	4.00	....	....	4.00	....	4.30	4.05	4.05	4.95	8.10	8.10	....	9.35
Milwaukee	4.199	5.349	5.249	4.199	....	4.499	4.249	4.249	5.149	8.399	8.399	9.649	9.649
Cleveland	....	....	....	4.188	....	4.30†	4.311	4.05	4.95	8.358	8.358	9.35	9.35
Buffalo	4.00	5.15	5.35	4.302	6.002	4.65	4.05	4.05	4.95	8.10	8.10	9.35	9.35
Detroit	4.14	5.29	5.42	4.34	....	4.59	4.42	4.19	5.00	....	....	....	....
Cincinnati	4.116	4.716	5.166	....	....	4.803	....	....	5.252	....	....	....	....
St. Louis	4.199	5.349	5.424	4.199	....	4.499	4.249	4.249	5.324	8.574	8.574	9.824	9.824
Pittsburgh	3.725	4.60[1]	....	4.00	....	3.95	3.80	4.05	4.95	8.10	8.10	9.35	9.35
St. Paul	3.384[7]	5.534[1]	5.434[2]	4.404[7]	....	4.684[7]	4.434[7]	4.434[7]	5.726[6]	....	10.084[6]	....	11.726[6]
Duluth	....	....	....	....	....	....	....	....	....	....	....	....	....
Omaha	4.868	6.618[1]	5.918	4.862	....	5.168	4.918	4.918	5.818	....	....	....	....
Indianapolis	....	....	....	....	....	....	....	....	....	....	....	....	....
Birmingham	3.85	....	5.20	4.10	....	4.30	4.05	4.05	5.83	....	....	....	....
Memphis	....	....	....	....	....	....	....	....	....	....	....	....	....
New Orleans	*4.46[11]	5.77[1]	....	....	....	4.83[11]	*4.68[11]	*4.78[11]	6.14	....	....	....	....
Los Angeles	....	....	....	....	....	....	....	....	....	....	....	....	....
San Francisco	4.90[8]	6.30[9]	6.45	5.20[8]	....	5.00[8]	4.90[8]	4.70[8]	7.00[10]	....	....	....	....
Seattle	5.00	7.80	6.05	....	....	5.25	4.95	4.90	6.75	....	....	....	....
Portland	5.00[3]	....	6.25	....	....	5.40	5.10	5.10	....	....	....	....	....
Salt Lake City	5.85	....	7.10	....	....	5.55	5.85	5.95	7.00	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 10,000 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999.

(*) Philadelphia: Galvanized sheet, 25 or more bundles.

* Add 46¢ for sizes not rolled in Birmingham.

** City of Philadelphia area only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area after deducting 34¢ per 100 lb (L.c.l. Sparrows Point to Philadelphia).

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES† (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	31.00	31.50	32.00	32.50	.....	Boston	Everett	$0.50 Arb.	29.50	30.00	30.50	31.00	.....
Birdsboro	34.00	34.50	35.00	35.50	39.00	Boston	Birdsboro-Steelton	4.82	....	....	....	....	40.82*
Birmingham	26.38	26.88	....	....	.....	Brooklyn	Bethlehem	3.00	34.00	34.50	35.00	35.50	.....
Buffalo	30.00	30.50	31.00	31.50	.....	Brooklyn	Birdsboro	3.50	....	....	....	....	43.50
Chicago	30.00	30.50	30.50	31.00	.....	Canton	Clev., Ygstn., Sharpsville	1.67	31.67	32.17	32.17	32.67	.....
Cleveland	30.00	30.50	30.50	31.00	.....	Cincinnati	Birmingham	4.87	31.25	31.75	....	....	.....
Detroit	30.00	30.50	30.50	31.00	.....	Jersey City	Bethlehem	1.84	32.84	33.34	33.84	34.34	.....
Duluth	30.50	31.00	31.00	31.50	.....	Jersey City	Birdsboro	2.33	....	....	....	....	41.33
Erie	30.00	30.50	31.00	31.50	.....	Los Angeles	Provo	5.94	35.94	36.44	....	....	.....
Everett	29.00	29.50	30.00	30.50	.....	Mansfield	Cleveland-Toledo	2.33	32.33	32.83	32.83	33.33	.....
Granite City	30.00	30.50	30.50	31.00	.....	Philadelphia	Swedeland	1.01	32.01	32.51	33.01	33.51	.....
Neville Island	30.00	30.50	30.50	31.00	.....	Philadelphia	Birdsboro	1.49	....	....	....	....	40.49
Provo	30.00	30.50	....	....	.....	San Francisco	Provo	5.94	35.94	36.44	....	....	.....
Sharpsville	30.00	30.50	30.50	31.00	.....	Seattle	Provo	5.94	35.94	36.44	....	....	.....
Steelton	31.00	31.50	32.00	32.50	38.00	St. Louis	Granite City	0.75 Arb.	30.75	31.25	31.25	31.75	.....
Swedeland	31.00	31.50	32.00	32.50	.....								
Toledo	30.00	30.50	30.50	31.00	.....								
Troy, N. Y.	....	....	....	....	38.00								
Youngstown[1]	30.00	30.50	30.50	31.00	.....								

* To $43.82.

(1) Struthers Iron & Steel Co., Struthers, Ohio, charges 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base price for low phosphorous $37.50 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, $42.99. High phosphorous charcoal pig iron is not being produced.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$38.00; f.o.b. Buffalo—$39.25. Add $1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.40	6.65	7.20
Ton lots	7.30	7.90	9.80
Less ton lots	7.70	8.30	10.20

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$39.00	$40.00
F.o.b. Pittsburgh		44.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00	21.40	21.65
0.10% max. C	20.50	20.90	21.15
0.15% max. C	20.00	20.40	20.65
0.30% max. C	19.50	19.90	20.15
0.50% max. C	19.00	19.40	19.65
0.75% max. C, 7.00% max. Si	16.00	16.40	16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.45
Ton lots	7.40
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	6.15
Ton lots	7.05
Less ton lots	7.45

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $56.00 f.o.b. Keokuk, Iowa; $52.75 f.o.b. Jackson, Ohio; $54.00 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	14.65	16.90	18.65
97% Si, 1% Fe	15.05	17.30	19.05

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb briquets.

	Eastern	Central	Western
Carload, bulk	3.85	4.10	4.30
Ton lots	4.75	5.35	5.65
Less ton lots	5.15	5.75	6.05

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	11.65	...	...
50% Si	7.45	7.95	8.15
75% Si	9.25	9.55	10.30
80-90% Si	10.45	10.75	11.50
90-95% Si	12.05	12.35	13.05

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.50	21.90	22.50
0.50% C	21.00	21.40	22.00
1.00% C	20.50	20.90	21.50
2.00% C	19.50	19.90	20.50
65-69% Cr, 4-9% C	15.60	16.00	16.15
62-66% Cr, 4-6% C, 6-9% Si	16.60	17.00	17.15

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.85	10.10	10.20
Ton lots	10.75	11.65	12.25
Less ton lots	11.15	12.05	12.65

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	16.70	17.10	17.25
Ton lots	17.90	19.20	20.00
Less ton lots	18.60	19.90	20.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	16.50	17.35	19.10
Less ton lots	17.00	17.85	19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.60	$2.35	$2.95
Less ton lots	1.95	2.70	3.75

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots	13.50	14.60	16.55
Less ton lots	14.25	15.35	17.30

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	13.25	14.35	16.30
Less ton lots	14.00	15.10	17.05

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	13.25	14.35	16.30
Less ton lots	14.00	15.10	17.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed — $1.98

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90

Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5 — $1.10

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.

Ton lots	$2.50
Less ton lots	$2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo — 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo — 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo — 80¢

Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo — 80¢

Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti — $1.23

Less ton lots — $1.28

Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti — $1.35

Less ton lots — $1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton — $142.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo), Tenn., $3 unitage per gross ton. — $65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots	14.50¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy

Carload, bulk	4.85¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload — 6.25¢

Ton lots — 6.75¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots	8.50¢
Ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	35¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	87.5¢
No. 6	60¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

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The London Economist

(CONTINUED FROM PAGE 111)

engineering and economics of power while head of the Tennessee Valley Authority, and he regards the meagre and hesitant disclosures that have been made about atomic power for industry as naive. He will push research and development in this field hard.

It is reasonable to expect an announcement within 5 years that nuclear energy can produce electric power at costs figured in fractions of a mill per kilowatt-hour.

The commission has made a start in formulating employment policies for both technical and scientific workers. It is not as well realized as it should be that the centralized, integrated corps of scientists that achieved stunning successes during the war has fallen apart. It will never be put together again at the same level of efficiency. Ways and means must be found to bring it to some approximate of its former greatness.

In this direction the commission is compelled to face some facts of life that both the Army and Congress chose to ignore in their preoccupation with keeping the secret. A job with the Atomic Energy Commission must be attractive enough to invite a man competent to fill it, despite the stultifications of security regulations and the rather dismal environments of Oak Ridge (Dogpatch), Los Alamos (Happy Valley), and Hanford.

The commission's only important thought on this problem, so far, is that work at the sites must be integrated into work in the same field at universities, so that workers can spend some time in the academic atmosphere they prefer. The problem of scientific staff, moreover, is not the only one the commission must shortly face: Collective bargaining as it affects less specialized personnel also has peculiar aspects under these circumstances.

At the one site which has been opened for union negotiations, Oak Ridge, one plant has been won by the AFL, by a comfortable majority, one plant by the CIO in an uneasy victory of some two dozen votes in a total of about 4000, and one plant voted for no union. The contracts are renewable next December.

The commission has not faced its most dangerous problem, that of disseminating basic scientific information while keeping its secret. Members have nibbled at the problem, and the problem has nibbled at them. For instance, Mr. Lilienthal is supplied with reports of spy activity around "the secret." Indeed, such reports are gratuitously pressed upon him. He has no way of assessing the reliability of these reports, except by their character. He has no way of acting on them, even if they impressed him. Actually he is not greatly impressed by what has has seen of the spy problem.

But others may be; and it is what impresses others — Congress, the Army, the Departments of Justice and State—that is important to the fate of America's experiment in civilian control of a revolutionary factor in world affairs.

In the Senate hearings, the emphasis has been almost entirely on the question of military security. Mr. Bernard Baruch reportedly testified that Russian representatives betrayed a suspicious familiarity with secret processes. Mr. Lilienthal himself was goaded by his questioners into insisting that the major breach of security was the publication of the Smythe Report in 1945, which was authorized by General Groves, the arch-priest of security.

Sumner Pike, another Presidential appointee, in his testimony, made a promising attack upon the sterility of secrecy when he suggested that American national security would benefit more from rapid exploitation of the industrial possibilities of nuclear energy—which would require some freeing and exchange of information—than from a penny-wise, pound-foolish insistence upon paralyzing security measures.

In pursuing this double, and almost irreconcilable, task of advancing knowledge of the atom while preserving every security precaution, the commission must move very slowly.

The Republican Party leadership which now prevails in Congress, and expects to capture the executive power in 1948, does not like

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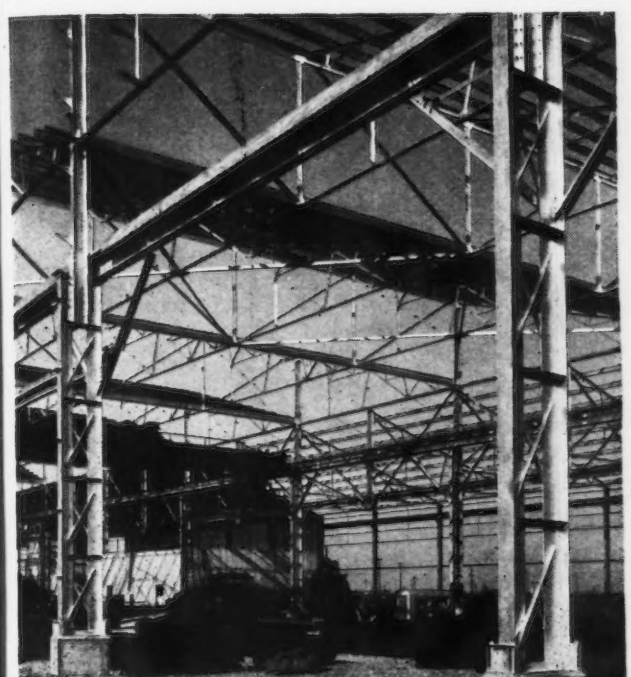

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Welding Linco Level Load trailer axles, Oakland

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the men President Truman appointed to the Atomic Energy Commission. It regards them as "collectivists." This probably will not block the confirmation of David Lilienthal, Dr. Robert F. Bacher, William W. Waymack, Sumner T. Pike and Lewis L. Straus. Republican elders do not feel prepared for a fight about atomic energy control now.

The talk is that the commission will be permitted to work along until 1949, when the law will be amended to increase its membership to 11, and 6 "private enterprisers" can be appointed. Perhaps things will develop as the Republicans plan.

But a mis-step by the commission on the problem of security of information, or some international incident that incites a flare of American fear or belligerence, could upset the commission overnight. Persons who understand how vital it is that the experiment in civilian control shall succeed should not underestimate the great hazards the Atomic Energy Commission must run these next few years. The commission has not fallen foul of any of these hazards yet. That is about all that can be said. It will be the most important and hopeful thing that can be said on any future day for a long time to come.

Car Registrations Climbing

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• • • **Passenger cars** registered in the United States have now climbed within 19 pct of the 1941 total, according to R. L. Polk & Co. statisticians for the automobile industry. Polk estimates at 25,142,527 passenger cars were registered in the United States in 1946.

The agency estimates that one-third of the 12.94 pct of the nation's cars which went off the roads between 1941 and 1944 have now been recovered.

In 1941 a total of 27,700,011 cars were registered, Polk said. In 1944 the number had dropped to 24,114,922. Between 1944 and 1946 registrations increased 4.26 pct.

Every state except California, Louisiana, Michigan, Minnesota and Nevada showed increases in registrations in 1946 over 1944, according to the Polk company.

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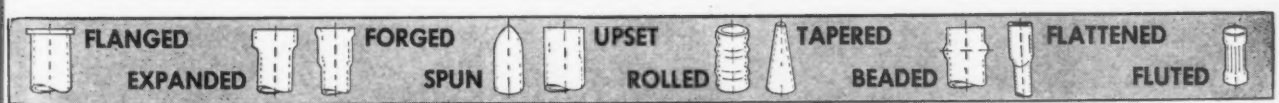

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10,000 TRADE NAMES

(*Continued from page 66*)

copper liners. **Union Steel Casting Co.**, 62nd & Butler Sts., Pittsburgh.

Union Free-Cut: Free machining steel for automatic screw machine parts. Union Drawn Steel Div., Republic Steel Corp., Massillon, Ohio.

Unimatic: Electroplated coatings of all types of metals. United Platers, Inc., 991 Madison Ave., Detroit.

Union Hymo Steel: Free machining case hardening steel with 1 Mn for case hardened parts, shafts, pinions. Union Drawn Steel Co., Republic Bldg., Massillon, Ohio.

Unionmelt: Electrical welding equipment for fusion welding beneath a molten mineral applied in granular form to submerge completely the welding action. Linde Air Products Co., 30 E. 42nd St., New York 17.

Union Metal: Seamless steel tubing for braces, stands, supports. Union Metal Mfg. Co., Canton, Ohio.

Union Maxcut: Low-C free machining bessemer steel with properties and heat treating behavior like S.A.E. X1112. Union Drawn Steel Div., Republic Steel Corp., Massillon, Ohio.

Union Multicut: Low-C free-machining open-hearth steel with properties similar to S.E.A. 1115; can be carburized and hardened to 60 Rc. Union Drawn Steel Div., Republic Steel Corp., Massillon, Ohio.

Unique: Core oil for foundry use. Certified Core Oil Div., Socony-Vacuum Oil Co., Inc., 3308 S. Cicero Ave., Cicero, Ill.

Uni-Top: Outdoor circuit breakers. Allis-Chalmers Mfg. Co., Milwaukee 1.

Universal: Bronze bars and babbitt. Johnson Bronze Co., 505 S. Mill St., New Castle, Pa.

Unishear: Electric hand shear for sheet metals. Stanley Electric Tools, New Britain, Conn.

Unit: Rubber-tired mobile, crawler, and motor truck cranes and shovels. Unit Crane & Shovel Corp., Milwaukee 14.

Unitable: Roller Tables for conveying plastic and rubber material from extruders. Island Equipment Corp., 101 Park Ave., New York 17.

Unitac Embossing Machine: Embossing of tags to identify material where rough handling in transit makes indestructible identification essential. Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh 13.

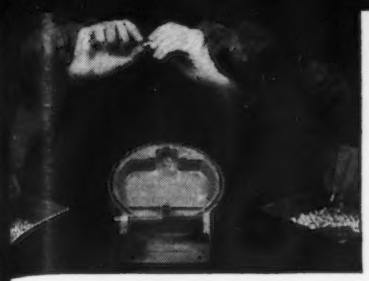
United States: Rail bonds. American Steel & Wire Co., Cleveland 13.

United Van-X: Cast steel rolling mill rolls. United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh 22.

Unitemper Mill: Method and mill for processing metal strip. United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh 22.

Unitex: Fire brick for use where resistance to high temperatures and maximum spalling resistance are desired. Quigley Co., Inc., 527 Fifth Ave., New York 17.

Unit-Load: Flat-steel band process with tool equipment, for bracing carload freight. Acme Steel Co., 2840 Archer Ave., Chicago 8.



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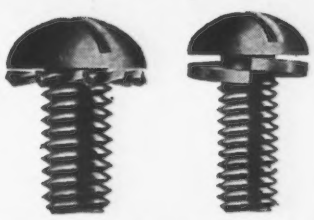

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Steel Co. of Canada, Ltd.
Hamilton, Ont., Canada

Stronghold
Screw Products Inc.
Chicago, Ill.

American Screw Co.
Providence, R. I.

Central Screw Co.
Chicago, Ill.

Chandler Products Corp.
Cleveland, Ohio

10,000 TRADE NAMES

Unitized: Metal-enclosed switchgear. Westinghouse Electric Corp., E. Pittsburgh.

Uni-Top: Outdoor circuit breakers. Allis-Chalmers Mfg. Co., Milwaukee 1.

Unitrol: Modern, standardized motor control center; completely sectionalized so it can be expanded, changed or contracted as requirements demand. Cutler-Hammer, Inc., 315 N. 12th St., Milwaukee 1.

Univan: Nickel-vanadium-manganese steel for casting of locomotive frames, coupling boxes, spindles. Union Steel Casting Co., 62nd & Butler Sts., Pittsburgh.

Univan: Tough Mn-V steel for general castings. Uddeholm Co. of America, Inc., 157 E. 44th St., New York.

Universal: Bronze bars, cored and solid. Completely machined. Johnson Bronze Co., 505 S. Mill St., New Castle, Pa.

Universal: Face milling cutter, having steel body and detachable solid Kennametal blades. Kennametal, Inc., Latrobe, Pa.

Universal: Gas atmosphere generator-exothermic gas generator, endothermic gas cracker, ammonia dissociator. Associated Industrial Engineers, Inc., 1505 Race St., Philadelphia 9.

Universal: High-speed foot-operated tapping machines. Procunier Safety Chuck Co., 18 S. Clinton St., Chicago 6.

Universal: Milling and boring machines. Universal Boring Machine Co., 314 Main St., Hudson, Mass.

Universal Alloy: Cu alloy with 85 pct conductivity for electrode tips, seam welding rolls. Universal Alloys, Inc., Newark, N. J.

Uniweld: Solid-phase welding using oxyacetylene torch and hydraulic pressure. Menasco Mfg. Co., Burbank, Calif.

Upson: Bolts and nuts. Republic Steel Corp., Republic Bldg., Cleveland.

Usalox: Aluminum-oxide abrasive. Clover Mfg. Co., Norwalk, Conn.

Usaloy: Aluminum-oxide abrasive. Clover Mfg. Co., Norwalk, Conn.

U. S.: Woven wire fence. American Steel & Wire Co., Cleveland 13.

U. S. S.: All products of subsidiaries of U. S. Steel Corp. Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 30.

U. S. S.: High-tensile steel wire; stainless steel wire. American Steel & Wire Co., Cleveland 13.

Utah: Electro-magnetic vibrating feeders, screens, conveyors and dryers. Allis-Chalmers Mfg. Co., Milwaukee 1.

Utaloy: Steel castings of all types. Eimco Corp., Salt Lake City 8.

Utility: Bearing metals. Hill Pump Valve Co., 2730 Elston Ave., Chicago.

UX: Alloy cast-iron rolls for rolling mills. United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh 22.

— V —

Vacu-Blaster: Blast cleaner with a vacuum return system for used abrasives. Vacu-Blast Co., Inc., 1054 Broadway, Burlingame, Calif.

Vacumatic: Vacuum pumps. I. Shor, 64 W. 48th St., New York 19.

Vacuum Cup: Metal pulleys with vacuum cupping on surface to reduce slippage. Vacuum Cup Metal Pulley Co., Inc., 12536 Grand River Ave., Detroit.

Valenite: Air-dry and baking enamels in all colors. Valentine & Co., 11 E. 36th St., New York.

Valvoline: See Tectyl.

Vanadium: Genuine babbitt metal. H. Murdoch & Co., Frick Bldg., Pittsburgh.

Vancoram: Series of ferroalloys for metallurgical applications. Vanadium Corp. of America, Bridgeville, Pa.

Vancoram Brand: Ferrovanadium, ferrochromium, ferrosilicon, ferrotitanium, special alloys for iron and steelmaking; metals, carbides, chemicals. Vanadium Corp. of America, 420 Lexington Ave., New York 17.

Vancorum Ferro: 50-80 V steel in steel manufacturing. Vanadium Corp. of America, Bridgeville, Pa.

Van Der Horst: See Porous-Krome.

Vanick: High-test gray iron with 2.5 C, 2.5 Si, 0.5 Ni, Mn-V, for general casting. Malleable Iron Fitting Co., 23 Thatcher St., Branford, Conn.

Vanite: Abrasives. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Vapocarb-Hump: Process for hardening; uses electric furnace with protective atmosphere; pyrometer shows both temperature of work and difference between work and furnace wall and critical located by Hump Method. Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44.

Vapro: Chemical vapor cleaner for autos. Turco Products, Inc., Los Angeles 54.

Vari-Amp: Adjustment for feeder voltage regulators. Allis-Chalmers Mfg. Co., Milwaukee 1.

Varicut: Milling cutters. Wesson Co., 1222 Woodward Heights Blvd., Ferndale 20, Mich.

Variflex: Portable (1 hp) electric, three-speed motors for flexible-shaft equipment. Mall Tool Co., 7740 S. Chicago Ave., Chicago 19.

Vari-Pitch: Variable diameter V-belt sheaves and speed changers. Allis-Chalmers Mfg. Co., Milwaukee 1.

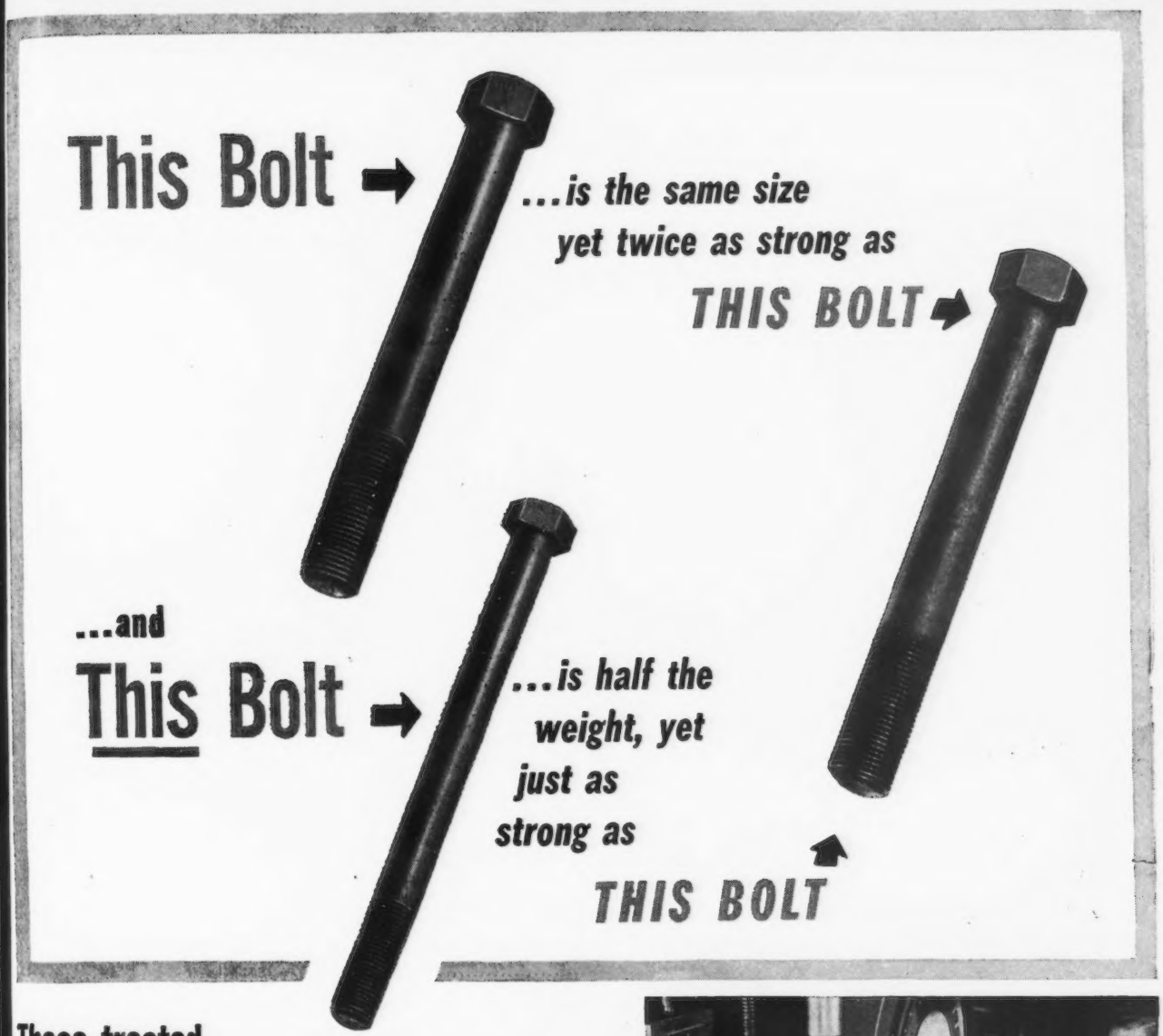
Vari-Rest: Work support accessory for use with the Rockwell hardness tester in supporting pieces not too heavy and only a few feet long. Wilson Mechanical Instrument Co., 383 Concord Ave., New York 54.

Vascoloy-Ramet: Sintered carbide (tungsten, titanium, columbium, tantalum) blanks, tools, dies and special shapes. Vascoloy-Ramet Corp., North Chicago, Ill.

Vaughn: See Motobloc.

Vectolite: Light weight permanent-magnet material, made of powdered iron rust and cobalt oxide. General Electric Co., Schenectady 5.

Vedoc: Air-dry and baking organic finishes

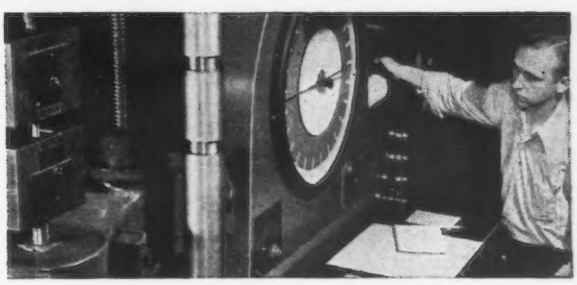


These treated NICKEL ALLOY STEEL BOLTS will develop 100% greater unit tensile strength than untreated carbon steel bolts

Whether you aim to gain greater holding power, or save weight and gain space, these Nickel alloy steel bolts will help you.

If bolt holes are already in the part, ¾" heat-treated 3135 or 8635 Nickel alloy steel bolt gives twice the holding power of a ¾" untreated 1020 carbon steel bolt.

On the other hand, if bolt holes are not in, and design does not permit a ¾" bolt, remember a ½" bolt of the same Nickel alloy steels, heat treated, gives almost as much holding power as a ¾" untreated 1020 carbon steel bolt, *and weighs less than half as much.*



Tensile testing Nickel alloy steel bolts at the plant of Lamson & Sessions Company, Cleveland, Ohio.

INCO Nickel
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and application of alloys containing Nickel. This information and data are yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

in white and colors for washing machines, kitchen cabinets, appliances, etc. Liquid Plastic Div. of Ferro Enamel Corp., 4150 E. 56th St., Cleveland.

Veelos: Link V-belts. Manheim Mfg. & Belting Co., Manheim, Pa.

Velocity Power Tools: Portable, easily-operated, self-contained tools for field use in construction and repair work; rail punches, cable splicers, rivet expanders and removers, etc. Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh.

Velvet: Copper alloy for bushings, bearings, bars. Union Bronze Co., Reading, Pa.

Velvet Antifriction Metal: Bearing babbitt. McKechie Bros., Ltd., Birmingham, England.

Velvetouch: Sintered Cu-Pb-Sn-Graphite for clutch and brake disks, linings, bearings, facings. S. K. Wellman Co., 1374 E. 51st St., Cleveland.

Canadian Steel Production and Shipments

Toronto

• • • **Canadian production and producers' shipments of primary iron and steel shapes for the month of November showed a substantial gain over the two preceding months. During November primary shapes produced in Canadian steel mills totalled 246,244 net tons of which carbon steel accounted for 238,868 tons and alloy steel 7376 tons while shipments for the month totalled 246,547 net tons and included 238,778 tons of carbon steel shapes and 7769 tons of alloy steel shapes. For October 146,979 tons of carbon steel shapes were made and 164,099 tons shipped; 7214 tons of alloy steel shapes were made and 8481 tons shipped, while for the month of September 67,069 tons of carbon shapes were made and 68,251 tons shipped and 4272 tons of alloy steel shapes were made and 3819 tons shipped.**

For the eleven months ended in November, production of carbon steel shapes totalled 2,064,929 net tons and shipments amounted to 2,077,645 tons while 66,810 tons of alloy steel shapes were made and 65,540 tons were shipped. The following table shows production and shipments of primary iron and steel shapes for November in net tons:

November, 1946	Carbon Steel		Alloy Steel	
	Made	Shipped	Made	Shipped
Billets, etc., for forging	8,108	7,168	734	667
Other semi-finished shapes not for re-rolling	34,363	29,810	322	284
Structural shapes and piling	13,994	13,331	.....	.....
Plates	16,315	17,351	.....	.....
Rails	16,601	22,574	.....	.....
Tie plates and track material				
Splice bars	1,249	544	.....	.....
Tie plates	4,593	4,630	.....	.....
Spikes	1,022	935	.....	.....
Tool steel	445	309	389	273
Hot-rolled bars for forging	6,937	6,112	1,806	2,471
Concrete reinforcing bars	3,694	4,058	.....	.....
Hot-rolled bars for cold finishing	406	428	.....	.....
Other hot-rolled bars	37,686	37,451	2,638	2,615
Pipes and tubes	10,509	10,776	.....	.....
Wire rods	23,239	23,935	34	34
Hot-rolled black sheets	19,463	17,530	.....	.....
Cold-reduced black sheets	1,929	1,929	.....	.....
Galvanized sheets	5,253	6,324	.....	.....
Steel castings—By ingot makers	1,230	1,485	24	44
By other foundries	3,128	3,593	1,294	1,242
All other shapes including tinplate, tin mill blackplate, cold-finished bars and strip, etc.	28,704	28,505	135	139
TOTAL	238,868	238,778	7,376	7,769

Producers' shipments of primary iron and steel shapes, sub-divided according to principal consuming industries for November, in net tons follow:

Industry	Carbon Steel	Alloy Steel
Automotive industries	5,473	4,352
Agricultural, including farm machinery	8,874	55
Building construction	24,580	56
Containers industry	14,249	7
Machinery and tools	10,034	634
Merchant trade products	27,058	468
Mining, lumbering, etc.	7,742	189
National defense	136	4
Pressing, forming and stamping	9,531	69
Public works and utilities	882	48
Railway operating	27,148	244
Railway cars and locomotives	6,348	21
Shipbuilding	4,106	22
Miscellaneous and unclassified	1,090	89
Wholesalers and warehouses	27,540	343
Producers' interchange	51,353	266
Direct export—To British Empire	5,539	116
To other countries	7,095	788
TOTAL	238,778	7,769

10,000 TRADE NAMES

Ventube: Flexible ventilating tubing. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Venturi Meter: Differential producer used to totalize, indicate, and record the flow of liquids, air or gas. Builders-Providence, Inc., 9 Codding St., Providence, R. I.

Veriloy: 21 Ni, 11 Cr heat and corrosion resisting steel for chemical engineering equipment and furnace parts. Driver-Harris Co., Harrison, N. J.

Vernier-Set: Synchronous motor-driven time control device with single-pole double-throw contact action for operation of motors, signals and valves on a split second timed basis. Automatic Temperature Control Co., Inc., 34 E. Logan St., Philadelphia 44.

Vers-o-tools: Automatic heads, threading, end forming, end turning and combination use. National Acme Co., 170 E. 131st St., Cleveland 8.

Vertex: Arcwelding electrode for steel; corresponds to AWS E-6010. Metal & Thermit Corp., 120 Broadway, New York 5.

Vertex: Oilproof, heat and light-resistant elastic enamel in aluminum grays. J. C. Whitlam Mfg. Co., Wadsworth, Ohio.

Vesuvius: Heat-resistant 30 Cr high-carbon stainless for furnace parts, stokers, grids. Thos. Firth & John Brown, Ltd., Sheffield, England.

V-Foundry Alloys: Ladle addition for cast irons to control chill, increase strength, improve microstructure. Vanadium Corp. of America, 420 Lexington Ave., New York 17.

Vibrac: Cr-Ni-Mo alloy steels for shock resistance in tool holders, engine parts, gear wheels, shafts. Vickers-Armstrong, Ltd., London, England.

Vibrex: Vibrating screens. Robins Conveyors, Inc., 270 Passaic Ave., Passaic, N. J.

Vibro-Shakeout: Units for shaking foundry castings. Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

Vicalloy: Permanent-magnet alloy containing vanadium, iron and cobalt; can be machined and rolled into thin strip, after which magnetic properties similar to Remalloy developed by simple heat treatment; used for sound-recording tape. Bell Telephone Laboratories, Murray Hill, N. J.; Arnold Engineering Co., 147 E. Ontario St., Chicago 11.

Victor: Tungsten alloy and molybdenum alloy hacksaw blades. Victor Saw Works, Inc., Middletown, N. Y.

Victor: Sewed-pieced buff. F. L. & J. C. Codman Co., Rockland, Mass.

Victoray: Photostat making equipment for office use. Victoray Corp., 245 E. 23rd St., New York 10.

Victory Points: Patented mounted grinding wheels with demountable spindles. Abrasive Co., Div. of Simonds Saw & Steel Co., Philadelphia 37.

Victory-W: Barbed wire. Continental Steel Corp., Box 744, Kokomo, Ind.

Viculoy: Copper alloy with hardness up to 400 Brinell and tensile strength up to 160,000 psi. Akron Bronze & Aluminum Co., 579 Washington St., Akron 11, Ohio.

10,000 TRADE NAMES

Viking: Firebrick. Mexico Refractories Co., Mexico, Mo.

Vinco: Gear rolling inspection fixtures; spline and gear grinders; gages. Vinco Corp., 8881 Schaefer Highway, Detroit 27.

Vinsol: High melting point resin for insulating compounds, lacquers and varnishes. Hercules Powder Co., Inc., Wilmington, Del.

Vinylite: Vinyl resin rigid and elastomeric molding materials and extrusion compounds; rigid sheets; flexible sheeting and film; cloth calendering compounds; resins for surface coatings and adhesives. Bakelite Corp., 300 Madison Ave., New York 17.

Vinylite Resin VMCH: Modified vinyl chloride-acetate co-polymer; base resin for high quality surface coatings high adhesion, chemical resistance, water resistance. Plastic Div., Carbide & Carbon Chemicals Corp., 30 East 42nd St., New York 17.

Vinylseal: Synthetic resin adhesives. Bakelite Corp., 300 Madison Ave., New York 17.

Virgo: Alloy steel for containers and pots for molten salt. Schneider & Cie, Paris, France.

Visual Gage: Comparators utilizing the reed mechanism. Sheffield Corp., Box 893, Dayton 1.

Vitallium: Investment cast Co-Cr-Mo alloy; high fusing, nonmachinable, nonforgeable, corrosion, wear and abrasion resistant. Austenal Laboratories, Inc., 224 E. 39th St., New York 16.

Vitalon: Plastic material used for dentures. Austenal Laboratories, Inc., 224 E. 39th St., New York 16.

Vitol: For cleaning fine finishes. Turco Products, Inc., Los Angeles 54.

Vitrenamel: Steel sheets designed for porcelain enameling. Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh.

Vitreo: Porcelain enamels in all colors. Vitreous Steel Products Co., Box 1793, Cleveland 5.

Vitreosil: Vitreous silica immersion heaters for corrosive liquids. Thermal Syndicate, Ltd., 12 E. 46th St., New York 17.

Vitreosil: Fused alumina and magnesia crucibles for melting precious metals at up to 3270°F. Thermal Syndicate Ltd., 12-14 Old Pye St., Westminster, S. W. 1, London.

Vitrohm: Vitreous enamel for embedding electrical resistance elements. Ward Leonard, 31 South St., Mt. Vernon, N. Y.

Vitrolite: Opaque structural glass with a brilliant reflective finish produced in white, black and variety of colors. Libbey-Owens-Ford Glass Co., Toledo 3.

Vizabledg: Safety treads with smaller meshes next to the front edge of step. Irving Subway Grating Co., Inc., 27th St. and 51st Ave., Long Island City 1, N. Y.

V-Mang: Alloy steel with 12 to 14 Mn, some Mo. For replacing nickel-manganese rod in the reclamation of manganese steel and other ferrous parts by repairing fractures, building-up, etc. American Manganese Steel Div., American Brake Shoe & Foundry Co., Chicago Heights, Ill.

10,000 TRADE NAMES

V-Mang: Special manganese steel welding electrodes. American Manganese Steel Div., Chicago Heights, Ill.

V-Mang-Hardface: Welding rod. American Brake Shoe Co., 230 Park Ave., New York 17.

V-Metalustre: Metallic-luster lacquer having no metal-powder pigment; for protective coatings to simulate or replace metal paint. Mass & Waldstein Co., Newark, N. J.

Voelker Process: German (sodium-hydroxide electrolyte) method of coating magnesium alloys for protection and paint base. American Magnesium Corp., 2210 Harvard St., Cleveland.

Volco: Series of brasses for jewelry, hardware, screen wire, coins, stampings. Volco Brass & Copper Co., Kenilworth, N. J.

Volvit: 91-9 copper tin alloy for bearings. Osnabruck Kupfer Und Drahtwerke, Osnabruck, Germany.

Volz: Drop-forged plate-lifting clamp. Merrill Bros., Maspeth, New York, N. Y.

V. R. D.: Speed changers. Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

V-Tite: Ring-type joint gaskets of any metal or cross-section for use in ring-type joint flanges. Goetze Gasket & Packing Co., Inc., New Brunswick, N. J.

Vulcan: All kinds of molds for iron and steel. Vulcan Mold & Iron Co., Latrobe, Pa.

Vulcan: Heat-treating furnaces. Vulcan Corp., 1701 Arch St., Philadelphia 3.

Vulcan: Silica brick for high-temperature furnaces. McFeely Brick Co., Latrobe, Pa.

Vulcan Stainless: Straight-chrome stainless steels for valves, fittings, chemical apparatus. Vulcan Crucible Steel Co., Aliquippa, Pa.

Vulcanite: Silicon-carbide abrasive. Clover Mfg. Co., Norwalk, Conn.

Vulc-Iron: Desulphurized gray iron, highly resistant to fire cracking and thermal shock, used for ingot molds. Vulcan Mold & Iron Co., Latrobe 17, Pa.

Vulc-Iron: See Vulcan.

Vulco Etch: Etchant for preparing aluminum for spot welding. Turco Products, Inc., Los Angeles 54.

Vulcobase: Cover for tire valves. A. Schrader's Son Div., Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 17.

Vulcoid: Phenolic resin plus vulcanized fibre; relatively high strength, ease of fabrication, moisture-resistance, and high electrical insulating value; for electrical and mechanical insulating and structural parts. Continental Diamond Fibre Co., Newark 45, Del.

Vulcote: Oil-type enamels, synthetic enamels and lacquer-enamels, air dry or baking, for metal articles and machine tools. Glidden Co., 11001 Madison Ave., Cleveland 2.

Vycor Nos. 790 and 792: 96 pct silica glass; low expansion (8 x 10-7), high softening point, resistance to acids, alkalies and heat; for process industry equipment, laboratory apparatus, etc. Corning Glass Works, Corning, N. Y.

10,000 TRADE NAMES

— W —

W-Al-Co: Gas welding rod and arc-welding electrode for Al. W. S. Tyler Co., 3612 Superior St., Cleveland.

W-Al-Co: Rods for aluminum arc and gas welding. Empire Sheet & Tin Plate Co., Mansfield, Ohio.

Wabco: Molded composition packing for packing cups, gaskets, seals, etc., in pneumatic, hydraulic or vacuum equipment. Westinghouse Air Brake Co., Industrial Div., Wilmerding, Pa.

Wabcoloy: Wear-resistant nickel cast iron with Si-Mn or Cr or Mo; for cylinders of steam-driven compressors. Westinghouse Air Brake Co., Wilmerding, Pa.

Wales: Perforating dies for sheet metal, angles and shapes. Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y.

Walles Splice: Improved type of tucked eye splice in which all strand ends are concealed and no servings are needed. John A. Roebling's Sons Co., Trenton 2, N. J.

Wallseal: For sealing cracks and leaking areas in walls. Stonhard Co., 401 N. Broad St., Philadelphia 8.

Waltham: Thread milling and small automatic machinery, gear-cutting machines, cylindrical sub-presses. Waltham Machine Works, Waltham, Mass.

Waraloy: Pb alloy with 20 Sn for solders. Hewitt Metals Corp., 1918 Stanly St., Detroit.

War Babbitt: Tin-lead-copper babbitt for bearings. Duquesne Smelting Corp., 50 33rd St., Pittsburgh.

Warco: All types of presses for sheet metal, from 50 to 200 tons; press brakes. Warren City Mfg. Co., 1946 Griswold St., Warren, Ohio.

Ware: See Hi-Lag.

Warman: Rust and corrosion-resistant steels for the oil and chemical industries. Warman Steel Casting Co., 6100 S. Boyle Ave., Huntington Park, Calif.

Warman: See Calduro, Calmar and Caloxo.

Warren-Teed Tools: Special openhearth carbon-steel tools. Warren Tool Corp., Warren, Ohio.

Washconite: Wear and temperature-resistant cast iron with Si-Ni-Cr for cylinders, liners, pistons. Washington Iron Works, 1512 6th Ave., South Seattle, Wash.

Washcote: Arcwelding electrode for steel; corresponds to AWS E-4510. Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14.

Waukegan: Wire, barbed wire. American Steel & Wire Co., Cleveland 13.

Waukesha Metal: Cu alloy with Ni, acid resistant, for castings for food and dairy equipment. Waukesha Foundry Co., Waukesha, Wis.

Wausite: Aluminum-oxide abrasive. Clover Mfg. Co., Norwalk, Conn.

Wayne Spray Booth Cleaners: Compound to reduce time and cost of cleaning paint spray booths. Wayne Chemical Products Co., Detroit 17.

10,000 TRADE NAMES

WB Brake: Magnetically operated brakes for motor-driven machinery. Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland 4.

W Bung: Special fire brick for malleable bung arches. Quigley Co., Inc., 527 Fifth Ave., New York 17.

Wear-Arc: See Arcaloy.

Wear-Arc 600: Hard-facing electrode designed for surfacing parts subject to impact and severe abrasion. Alloy Rods Co., York, Pa.

Wear Devil: Series of Fe and Co-Cr-Mo-W hard-facing welding electrodes some of which are abrasion, wear, shock and impact resisting. Champion Rivet Co., Harvard & E. 108th St., Cleveland.

Wearloy: Fe alloy for brake drums. Frank Foundries Corp., Moline, Ill.

Weartuf Steel: Wear and abrasion-resistant Mn-Si steel, for scraper blades, liners, mixers, chutes. Horace T. Potts Co., Erie Ave. and D St., Philadelphia.

Wearweld: Arc-welding electrode for building up surfaces to resist metallic abrasion. Lincoln Electric Co., 12818 Coit Rd., Cleveland 1.

Weather-Ometer: Equipment for reproducing accelerated weather changes to test finishes, paints, plastics, etc., Atlas Electric Devices Co., 361 W. Superior St., Chicago 10.

Weatherproof: Sheet steel roofing and sidings. Bethlehem Steel Co., Bethlehem, Pa.

Webb: Stainless steel wire, music and needle wire. Webb Wire Works, New Brunswick, N. J.

Webbite: See Tam.

Webert Alloy: Copper alloy with 14 Zn, 4 Si, and some Mn, for pressure diecastings. American Brass Co., Waterbury, Conn.

Wedge-Lock: Steel shelving, with balanced strength and used where overloading and rough treatment must be provided for. Berger Mfg. Div., Republic Steel Corp., Canton 5, Ohio.

Wehralloy: Series of stainless steels and irons for heat and corrosion-resistant parts. Wehr Steel Co., 5234 W. Mobile St., Milwaukee.

Weiralead: Lead alloy-coated steel sheets and long ternes. Weirton Steel Co., Weirton, W. Va.

Weircoloy: Galvanized copper-bearing sheet steel. Weirton Steel Co., Weirton, W. Va.

Weirite: Hot-dipped and electrolytic tinplate, manufacturing ternes. Weirton Steel Co., Weirton, W. Va.

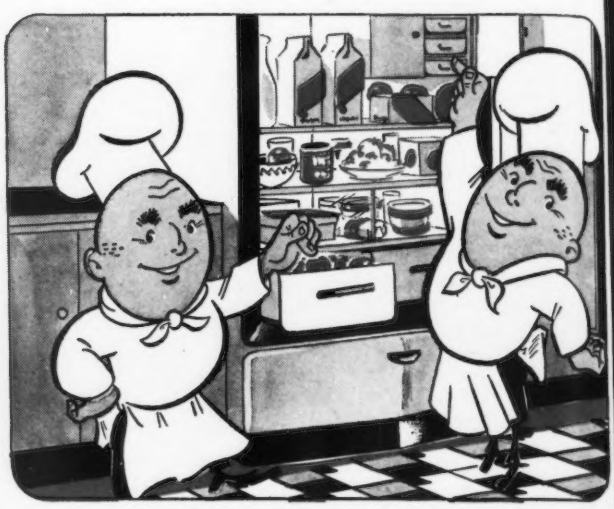
Weisberg Bright Copper: Bright copper-plating process for heavy copper deposits, using copper sulphate, diethylene triamine and ammonium sulphate. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Weirzin: Electrolytic zinc-coated steel sheets and strip. Weirton Steel Co., Weirton, W. Va.

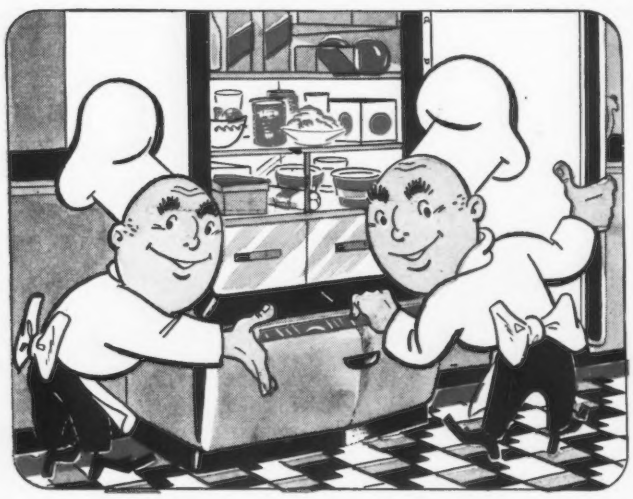
(To be continued next week)

How to bait a man trap

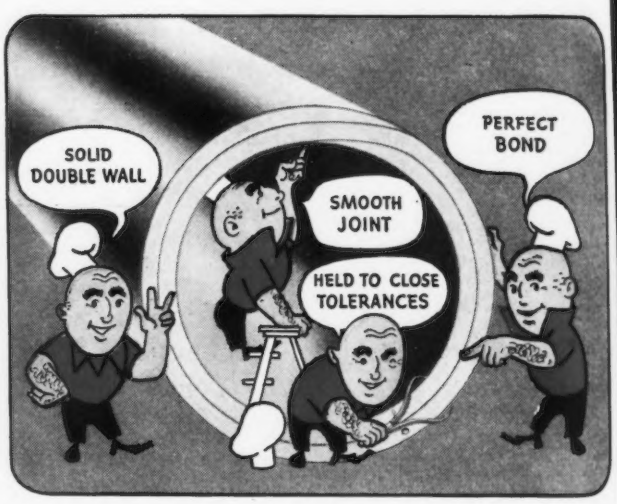
1. BAIT FOR a mantrap can be a luscious ice box cake, topped with frothy whipped cream, a crisp, fresh salad or a cold bottle of beer. Whatever suits a man's fancy best is his wife's sure way to anything from a trip to the movies to a new fur coat. But she can't set the snare by herself.



2. MILADY'S silent helper is her modern refrigerator. With its temperature regulator, rapid ice cube maker, frozen food compartment and a dozen other gadgets, it gives free play to her culinary talents. But refrigerators weren't always as dependable as those that grace kitchens of today.



3. BUNDYWELD Tubing in condenser coils, compressor lines and connecting tubes helped bring new dependability to refrigerators. And Bundyweld's hundreds of other uses include carrying fuel, oil, lubricants, vacuums and hydraulic fluids in motor vehicles and gas in modern ranges.



4. BUNDYWELD is different from other tubing. A single strip of basic metal, coated with a bonding metal, is rolled continuously twice laterally into tubular form, then metallurgically bonded by intense heat—carefully controlled—to form a solid, double wall tube, held to close dimensions.

5. SPECIFY BUNDYWELD! That's the recommendation today from an army of engineers and product designers who recognize the advantages of this unique, superior tubing. Let Bundy Research and Engineering Departments illustrate the advantages of Bundy Tubing for your product. Available in steel, Monel and nickel. Write: *Bundy Tubing Company, Detroit 14, Michigan.*

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